

Appendix D-1

Albuquerque Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Lovelace (ITRI)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-ITRI, the PTCSD data includes one Category 1 LLW stream, planned for disposal at the Nevada Test Site (NTS).

Table 1-ITRI. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01287	LLW-2	LLW	LLW - Compacted/Solidified/Neutralized	NTS	2,313.00

Radiological Profile

A site-wide isotope profile for application to the PTCSD stream was derived based on data reported by ITRI to the WMTDR. ITRI reported three LLW streams in the WMTDR (Table 2-ITRI). The planned disposition for all three streams was reported as disposal at NTS. Isotopes and concentrations were reported for each stream. The isotope profile, shown in Table 3-ITRI, is a composite of this data. Due to a lack of quantitative data for the three WMTDR streams (i.e., inventories or estimated disposal projections) there was no means to calculate weighted-average concentrations for each isotope. Therefore, the concentrations are the highest of those reported among the three streams for each isotope.

Table 2-ITRI. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name
ITRI0002	#01	Lab Waste
ITRI0003	#02	Biological
ITRI0004	#03	D&D

Table 3-ITRI. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)
Am-241	1.0000e-04
C-14	4.0000e-03
H-3	1.0000e-02
Pu-238	5.0000e-04
Pu-239	2.0000e-04
S-35	1.0000e-03
U-238	8.0000e-04

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Kansas City Plant (KCP)

PTCSD Streams and Projected Disposed Volumes

With the exception of ER, KCP was not required to report waste information in the PTCSD data. However, the NTS PTCSD data includes one KCP-generated LLW stream targeted to on-site disposal.

Table 1-KCP. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01195		LLW	LLW from Allied Signal (DP Site)	NTS	0.00

Radiological Profile

KCP did not report to the WMTDR. Therefore, the 95MWIR data was consulted for KCP isotope information. KCP reported one MLLW stream in the 95MWIR (see Table 2-KCP). Three isotopes and their associated concentrations were reported for the stream. The isotope profile (Table 3-KCP) applied to the PTCSD LLW stream is based on this data.

Table 2-KCP. Isotope Profile Basis - Category 1 LLW Streams

95MWIR Id	STP Id	Site Id	Stream Name
KC-W007	KC-W007		PM 147 CLEANUP WASTE - METAL

Table 3-KCP. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration Ci/M3
Cs-137	1.2429e-06
H-3	1.2429e-07
Pm-147	2.7619e-06

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Los Alamos National Laboratory (LANL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-LANL, the PTCSD data includes eight LANL LLW streams targeted to disposal: all on-site.

Table 1-LANL. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
02015	LLW-1	LLW	LLW-PCB	LANL	999.18
02016	LLW-2	LLW	LLW-Asbestos	LANL	13,147.15
02017	LLW-3	LLW	Non-Compactible	LANL	227,210.00
02019	LLW-5	LLW	Bulk (Non-Packaged)	LANL	102,022.04
02020	LLW-6	LLW	High H-3	LANL	50.70
02021	LLW-7	LLW	Non-DOT Approved PKG	LANL	19,457.78
02026	LLW-12	LLW	From LANL Compactor	LANL	161,972.89
02418	LAML	MLLW	Commercial Treatment Residues (to LLW)	LANL	47.00

Radiological Profile

A site-wide isotope profile for application to the eight PTCSD streams was derived based on data reported by LANL to the WMTDR. LANL reported 262 LLW streams in this data (Table 2-LANL), all destined for on-site disposal. Isotopes and associated concentrations were reported for all the streams. The isotope profile, shown in Table 3-LANL, is a composite of this data. The composite concentration for each isotope was calculated via Equation 1.

Table 2-LANL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name	WMTDR Id	Site Id	Stream Name
LANL1000		Metal Debris Without Pb or Cd	LANL1131		Unknown/Other Organic Debris
LANL1001		Paper/Cloth Debris	LANL1132		Unknown/Other Heterogeneous Debris
LANL1002		Paper/Cloth Debris	LANL1133		Metal Debris Without Pb or Cd
LANL1003		Unknown/Other Organic Debris	LANL1134		Soil
LANL1004		Unknown/Other Heterogeneous Debris	LANL1135		Metal Debris Without Pb or Cd
LANL1005		Metal Debris Without Pb or Cd	LANL1136		Metal Debris Without Pb or Cd
LANL1006		Paper/Cloth Debris	LANL1137		Paper/Cloth Debris
LANL1007		Unknown/Other Organic Debris	LANL1138		Unknown/Other Organic Debris
LANL1008		Unknown/Other Heterogeneous Debris	LANL1139		Unknown/Other Organic Homogeneous Solids
LANL1009		Metal Debris Without Pb or Cd	LANL1140		Metal Debris Without Pb or Cd
LANL1010		Asbestos Debris	LANL1141		Paper/Cloth Debris
LANL1011		Unknown/Other Heterogeneous Debris	LANL1142		Unknown/Other Organic Debris
LANL1012		Metal Debris Without Pb or Cd	LANL1143		Unknown/Other Heterogeneous Debris
LANL1013		Unknown/Other Inorganic Debris	LANL1144		Soil
LANL1014		Paper/Cloth Debris	LANL1145		Paper/Cloth Debris
LANL1015		Metal Debris Without Pb or Cd	LANL1146		Unknown/Other Heterogeneous Debris
LANL1016		Unknown/Other Organic Debris	LANL1147		Soil
LANL1017		Unknown/Other Heterogeneous Debris	LANL1148		Paper/Cloth Debris
LANL1018		Metal Debris Without Pb or Cd	LANL1149		Absorbed Organic Liquids
LANL1019		Metal Debris Without Pb or Cd	LANL1150		Glass Debris
LANL1020		Paper/Cloth Debris	LANL1151		Paper/Cloth Debris

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-LANL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name	WMTDR Id	Site Id	Stream Name
LANL1021		Paper/Cloth Debris	LANL1152		Unknown/Other Organic Debris
LANL1022		Metal Debris Without Pb or Cd	LANL1153		Metal Debris Without Pb or Cd
LANL1023		Composite Filter Debris	LANL1154		Composite Filter Debris
LANL1024		Metal Debris Without Pb or Cd	LANL1155		Absorbed Organic Liquids
LANL1025		Unknown/Other Heterogeneous Debris	LANL1156		Unknown/Other Heterogeneous Debris
LANL1026		Unknown/Other Organic Debris	LANL1157		Unknown/Other Heterogeneous Debris
LANL1027		Unknown/Other Heterogeneous Debris	LANL1158		Organic Absorbents
LANL1028		Unknown/Other Heterogeneous Debris	LANL1159		Metal Debris Without Pb or Cd
LANL1029		Unknown/Other Heterogeneous Debris	LANL1160		Paper/Cloth Debris
LANL1030		Unknown/Other Heterogeneous Debris	LANL1161		Soil
LANL1031		Metal Debris Without Pb or Cd	LANL1162		Soil
LANL1032		Metal Debris Without Pb or Cd	LANL1163		Unknown/Other Organic Debris
LANL1033		Paper/Cloth Debris	LANL1164		Unknown/Other Heterogeneous Debris
LANL1034		Metal Debris Without Pb or Cd	LANL1165		Unknown/Other Heterogeneous Debris
LANL1035		Unknown/Other Organic Debris	LANL1166		Metal Debris Without Pb or Cd
LANL1036		Unknown/Other Organic Debris	LANL1167		Glass Debris
LANL1037		Metal Debris Without Pb or Cd	LANL1168		Unknown/Other Organic Debris
LANL1038		Metal Debris Without Pb or Cd	LANL1169		Unknown/Other Heterogeneous Debris
LANL1039		Paper/Cloth Debris	LANL1170		Soil
LANL1040		Unknown/Other Organic Debris	LANL1171		Soil
LANL1041		Unknown/Other Heterogeneous Debris	LANL1172		Paper/Cloth Debris
LANL1042		Organic Absorbents	LANL1173		Unknown/Other Organic Debris
LANL1043		Metal Debris Without Pb or Cd	LANL1174		Soil
LANL1044		Asbestos Debris	LANL1175		Soil
LANL1045		Unknown/Other Plastic/Rubber Debris	LANL1176		Unknown/Other Heterogeneous Debris
LANL1046		Paper/Cloth Debris	LANL1177		Metal Debris Without Pb or Cd
LANL1047		Unknown/Other Organic Debris	LANL1178		Metal Debris Without Pb or Cd
LANL1048		Unknown/Other Heterogeneous Debris	LANL1179		Unknown/Other Heterogeneous Debris
LANL1049		Metal Debris Without Pb or Cd	LANL1180		Metal Debris Without Pb or Cd
LANL1050		Unknown/Other Organic Debris	LANL1181		Unknown/Other Organic Debris
LANL1051		Unknown/Other Heterogeneous Debris	LANL1182		Unknown/Other Heterogeneous Debris
LANL1052		Soil	LANL1183		Metal Debris Without Pb or Cd
LANL1053		Paper/Cloth Debris	LANL1184		Paper/Cloth Debris
LANL1054		Soil	LANL1185		Unknown/Other Heterogeneous Debris
LANL1055		Unknown/Other Organic Debris	LANL1186		Composite Filter Debris
LANL1056		Paper/Cloth Debris	LANL1187		Unknown/Other Heterogeneous Debris
LANL1057		Soil	LANL1188		Metal Debris Without Pb or Cd
LANL1058		Unknown/Other Homogeneous Solids	LANL1189		Paper/Cloth Debris
LANL1059		Soil	LANL1190		Unknown/Other Organic Debris
LANL1060		Asbestos Debris	LANL1191		Composite Filter Debris
LANL1061		Paper/Cloth Debris	LANL1192		Metal Debris Without Pb or Cd
LANL1062		Soil	LANL1193		Paper/Cloth Debris
LANL1063		Paper/Cloth Debris	LANL1194		Unknown/Other Heterogeneous Debris
LANL1064		Unknown/Other Organic Debris	LANL1195		Unknown/Other Organic Debris
LANL1065		Soil	LANL1196		Unknown/Other Heterogeneous Debris
LANL1066		Paper/Cloth Debris	LANL1197		Metal Debris Without Pb or Cd

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-LANL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name	WMTDR Id	Site Id	Stream Name
LANL1067		Soil	LANL1198		Metal Debris Without Pb or Cd
LANL1068		Soil	LANL1199		Metal Debris Without Pb or Cd
LANL1069		Soil	LANL1200		Paper/Cloth Debris
LANL1070		Paper/Cloth Debris	LANL1201		Organic Absorbents
LANL1071		Unknown/Other Organic Debris	LANL1202		Metal Debris Without Pb or Cd
LANL1072		Unknown/Other Heterogeneous Debris	LANL1203		Unknown/Other Organic Debris
LANL1073		Soil	LANL1204		Organic Absorbents
LANL1074		Metal Debris Without Pb or Cd	LANL1205		Paper/Cloth Debris
LANL1075		Paper/Cloth Debris	LANL1206		Unknown/Other Heterogeneous Debris
LANL1076		Unknown/Other Organic Debris	LANL1207		Soil
LANL1077		Soil	LANL1208		Unknown/Other Heterogeneous Debris
LANL1078		Soil	LANL1209		Unknown/Other Organic Debris
LANL1079		Metal Debris Without Pb or Cd	LANL1210		Composite Filter Debris
LANL1080		Unknown/Other Plastic/Rubber Debris	LANL1211		Metal Debris Without Pb or Cd
LANL1081		Paper/Cloth Debris	LANL1212		Paper/Cloth Debris
LANL1082		Unknown/Other Organic Debris	LANL1213		Unknown/Other Heterogeneous Debris
LANL1083		Unknown/Other Heterogeneous Debris	LANL1214		Unknown/Other Heterogeneous Debris
LANL1084		Soil	LANL1215		Metal Debris Without Pb or Cd
LANL1085		Soil	LANL1216		Unknown/Other Organic Debris
LANL1086		Unknown/Other Heterogeneous Debris	LANL1217		Unknown/Other Heterogeneous Debris
LANL1087		Soil	LANL1218		Soil
LANL1088		Unknown/Other Plastic/Rubber Debris	LANL1219		Paper/Cloth Debris
LANL1089		Paper/Cloth Debris	LANL1220		Paper/Cloth Debris
LANL1090		Unknown/Other Heterogeneous Debris	LANL1221		Composite Filter Debris
LANL1091		Asbestos Debris	LANL1222		Paper/Cloth Debris
LANL1092		Soil	LANL1223		Paper/Cloth Debris
LANL1093		Unknown/Other Heterogeneous Debris	LANL1224		Asbestos Debris
LANL1094		Soil	LANL1225		Paper/Cloth Debris
LANL1095		Soil	LANL1226		Metal Debris Without Pb or Cd
LANL1096		Soil	LANL1227		Paper/Cloth Debris
LANL1097		Soil	LANL1228		Unknown/Other Heterogeneous Debris
LANL1098		Paper/Cloth Debris	LANL1229		Paper/Cloth Debris
LANL1099		Unknown/Other Organic Debris	LANL1230		Asbestos Debris
LANL1100		Soil	LANL1231		Unknown/Other Organic Debris
LANL1101		Metal Debris Without Pb or Cd	LANL1232		Unknown/Other Inorganic Debris
LANL1102		Paper/Cloth Debris	LANL1233		Unknown/Other Heterogeneous Debris
LANL1103		Soil	LANL1234		Unknown/Other Organic Debris
LANL1104		Composite Filter Debris	LANL1235		Metal Debris Without Pb or Cd
LANL1105		Metal Debris Without Pb or Cd	LANL1236		Metal Debris Without Pb or Cd
LANL1106		Soil	LANL1237		Unknown/Other Organic Debris
LANL1107		Soil	LANL1238		Paper/Cloth Debris
LANL1108		Paper/Cloth Debris	LANL1239		Metal Debris Without Pb or Cd
LANL1109		Unknown/Other Heterogeneous Debris	LANL1240		Unknown/Other Heterogeneous Debris
LANL1110		Unknown/Other Heterogeneous Debris	LANL1241		Metal Debris Without Pb or Cd
LANL1111		Soil	LANL1242		Unknown/Other Heterogeneous Debris
LANL1112		Paper/Cloth Debris	LANL1243		Unknown/Other Heterogeneous Debris

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-LANL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name	WMTDR Id	Site Id	Stream Name
LANL1113		Soil	LANL1244		Unknown/Other Heterogeneous Debris
LANL1114		Soil	LANL1245		Unknown/Other Heterogeneous Debris
LANL1115		Paper/Cloth Debris	LANL1246		Unknown/Other Heterogeneous Debris
LANL1116		Unknown/Other Heterogeneous Debris	LANL1247		Unknown/Other Organic Debris
LANL1117		Unknown/Other Heterogeneous Debris	LANL1248		Unknown/Other Heterogeneous Debris
LANL1118		Unknown/Other Heterogeneous Debris	LANL1249		Metal Debris Without Pb or Cd
LANL1119		Unknown/Other Heterogeneous Debris	LANL1250		Metal Debris Without Pb or Cd
LANL1120		Unknown/Other Heterogeneous Debris	LANL1251		Composite Filter Debris
LANL1121		Metal Debris Without Pb or Cd	LANL1252		Metal Debris Without Pb or Cd
LANL1122		Unknown/Other Heterogeneous Debris	LANL1253		Soil
LANL1123		Unknown/Other Heterogeneous Debris	LANL1254		Paper/Cloth Debris
LANL1124		Absorbed Organic Liquids	LANL1255		Unknown/Other Organic Debris
LANL1125		Unknown/Other Homogeneous Solids	LANL1256		Metal Debris Without Pb or Cd
LANL1126		Metal Debris Without Pb or Cd	LANL1257		Paper/Cloth Debris
LANL1127		Unknown/Other Organic Debris	LANL1258		Unknown/Other Organic Debris
LANL1128		Wastewater Treatment Sludges	LANL1259		Composite Filter Debris
LANL1129		Unknown/Other Heterogeneous Debris	LANL1260		Unknown/Other Heterogeneous Debris
LANL1130		Metal Debris Without Pb or Cd	LANL1261		Unknown/Other Heterogeneous Debris

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3-LANL. Isotope Profile - Category 1 LLW Streams

Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)
Ac-227	6.5987e-09	Eu-152	1.3400e-08	Np-239	1.4520e-08	Sr-85	4.8732e-03
Ac-228	6.6706e-08	Eu-154	2.8581e-10	Np-242	2.1063e-13	Sr-90	3.0806e-05
Ag-108m	1.4085e-04	Fe-55	4.5805e-04	P-32	5.9414e-07	Ta-179	4.5840e-03
Ag-110m	3.4674e-03	Fe-59	3.5432e-03	P-33	9.3840e-09	Ta-182	4.2057e-04
Am-241	1.7372e-04	Gd-151	1.7633e-04	Pa-233	9.4543e-12	Tc-95m	8.2473e-05
Am-243	4.6403e-09	Gd-153	4.4434e-04	Pb-212	4.7201e-08	Tc-97	1.0244e-08
As-73	5.2493e-06	Ge-68	3.5756e-04	Pb-214	4.9323e-08	Tc-99	4.6364e-06
As-74	4.9073e-04	Gross Alpha	1.9867e-04	Pm-143	2.0471e-04	Th-227	9.2197e-11
Ba-133	2.6922e-03	Gross Beta	3.3564e-06	Pm-145	3.4774e-05	Th-228	5.2065e-07
Ba-140	7.0265e-09	Gross Gamma	1.1032e-07	Pu-238	3.4288e-04	Th-229	3.1619e-08
Be-7	1.3810e-03	H-3	3.9717e-01	Pu-239	6.9790e-04	Th-230	3.0376e-10
Bi-211	2.9742e-07	Hf-172	1.4880e-03	Pu-240	5.7611e-06	Th-232	2.6303e-06
Bi-214	5.6707e-08	Hf-175	2.8541e-04	Pu-241	5.3838e-05	Th-234	5.4260e-07
Bk-247	3.0436e-11	Ho-163	3.1234e-04	Pu-242	1.0204e-08	Ti-44	9.6748e-09
C-14	6.0066e-07	I-125	1.6744e-07	Ra-226	4.0672e-07	Tl-208	7.6389e-11
Ca-45	1.4513e-07	K-40	6.6641e-07	Rb-83	1.3826e-03	U-232	1.6259e-07
Cd-109	7.5231e-04	Lu-172	2.9854e-03	Rb-84	1.0600e-03	U-233	8.3747e-07
Ce-139	6.2087e-05	Lu-173	1.8866e-03	Rb-86	1.4829e-04	U-234	2.6942e-05
Ce-144	2.1065e-08	Lu-174	6.9539e-05	Re-183	2.9806e-05	U-235	5.5340e-06
Cl-36	2.8456e-08	MAP	2.8020e-05	Rh-101	9.9522e-04	U-238	1.0570e-04
Co-56	3.5150e-03	MFP	2.3749e-05	Rh-102	1.9091e-03	U-239	3.1996e-13
Co-57	7.8625e-03	Mn-52	7.2177e-09	Ru-106	5.5483e-09	V-48	1.9046e-05
Co-58	1.0576e-02	Mn-54	4.1886e-03	S-35	9.2966e-08	V-49	8.8389e-05
Co-60	1.8740e-03	Mo-99	3.1005e-09	Sb-124	1.4294e-12	V-52	7.1654e-10
Cr-51	3.4260e-04	Na-22	6.3429e-05	Sb-125	1.3462e-07	W-181	4.8982e-03
Cs-134	2.3775e-06	Nb-91m	2.7945e-03	Sc-44	9.6748e-09	W-185	6.5112e-03
Cs-135	1.4412e-07	Nb-92m	9.8725e-05	Sc-46	1.3875e-06	Y-88	8.5573e-04
Cs-137	3.3165e-05	Nb-95	2.1430e-03	Se-75	3.4547e-03	Zn-65	3.6093e-04
DU	8.3737e-08	Ni-59	7.0565e-07	Sm-145	2.6390e-04	Zr-88	2.6654e-03
Dy-159	4.5861e-04	Ni-63	1.2136e-07	Sn-113	1.4125e-05	Zr-95	4.1122e-05
Eu-149	1.1428e-04	Np-237	6.1580e-09	Sr-82	3.0203e-03		

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Pantex Plant (PTX)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PTX, the PTCSD data includes one LLW stream planned for disposal: at the NTS.

Table 1-PTX. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01348	LLW-1	LLW	LLW From Ops	NTS	1,403.40

Radiological Profile

The isotope profile applied to the PTCSD stream was derived based on data reported by PTX to the WMTDR. PTX reported 19 LLW streams in this data, all destined for disposal at the NTS. Isotopes were only reported for three of the streams, two of which included concentration data. The isotope data for the other sixteen streams was reported as "to be determined". The isotope profile, shown in Table 3-PTX, is a composite of the two streams (see Table 2-PTX) for which concentration data was reported. The composite concentration for each isotope was calculated via Equation 1.

Table 2-PTX. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
PX0028	0090 3071, NTS 80A	Contaminated Metal
PX0032	0009 4091, 0166 4092, NTS 94	Support Materials

Table 3-PTX. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration Ci/M3
H-3	1.0617e-03
Th-232	1.5929e-04
U-234	1.3369e-05
U-235	2.2986e-06
U-238	1.4419e-04

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Sandia National Laboratory - New Mexico (SNLN)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-SNLN, the PTCSD data includes 15 LLW streams planned for disposal: all at the NTS.

Table 1-SNLN. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00593	SNL-LLW1	LLW	PBFA-II	NTS	222.90
00594	SNL-LLW20	LLW	Septage	NTS	43.00
00595	SNL-LLW3	LLW	Reactor Materials	NTS	119.50
00596	SNL-LLW4	LLW	Neutron Generators	NTS	786.50
00598	SNL-LLW6	LLW	D&D - DOE #1	NTS	504.70
00600	SNL-LLW11	LLW	Thorium	NTS	4.00
00601	SNL-LLW12	LLW	Mo-99	NTS	874.80
00603	SNL-LLW14	LLW	Graphite	NTS	1.00
00604	SNL-LLW15	LLW	Asbestos	NTS	45.20
00605	SNL-LLW19	LLW	D&D #2	NTS	1,035.90
00606	SNL-LLW9	LLW	HDRV-DOE Disposal (#1)	NTS	33.80
01428	SNL-LLW13-1	LLW	Treated H3 Oil	NTS	5.00
01429	SNL-LLW16	LLW	Sources	NTS	0.10
01431	SNL-LLW17-1	LLW	Encapsulated Reactor Materials RH	NTS	7.00
01434	SNL-LLW5-1	LLW	Dewatered Resins	NTS	1.00

Radiological Profile

SNLN did not report to the WMTDR. Because of this, a DOE-wide, surrogate isotope profile for LLW was applied to the 15 PTCSC streams. This DOE-wide profile is shown in Table 3-SNLN.

Table 3-SNLN. DOE Complex-Wide LLW Isotope Profile

Isotope	Concentration (Ci/m3)	Isotope	Concentration (Ci/m3)	Isotope	Concentration (Ci/m3)
Al-26	3.2444e-10	K-40	1.2944e-05	Se-79	5.3119e-08
Am-241	8.4654e-04	Nb-93m	1.9253e-04	Sm-151	4.3026e-04
Am-243	3.2034e-07	Nb-94	8.6297e-06	Sn-121m	5.7738e-05
Ba-133	4.8407e-04	Ni-59	2.7883e-02	Sn-126	3.6344e-09
C-14	2.4177e-03	Ni-63	1.2565e+00	Sr-90	3.5712e+01
C-14 am	1.3683e-11	Ni-63 am	0.0000e+00	Tc-99	2.4871e-04
Cd-113m	3.5555e-05	Np-237	1.0202e-06	Th-229	6.9976e-09
Cl-36	1.6791e-06	Pa-231	5.9372e-06	Th-230	3.6903e-04
Cm-243	1.0242e-06	Pu Weap	0.0000e+00	Th-232	5.3182e-05
Cm-244	1.1429e-05	Pu-238	1.2899e-04	U nat	0.0000e+00
Co-60	5.6401e+00	Pu-239	7.3813e-04	U-232	7.7612e-07
Cs-135	6.9368e-08	Pu-240	1.7219e-04	U-233	1.0402e-05
Cs-137	3.0932e+01	Pu-241	7.7262e-04	U-234	8.3406e-04
Eu-152	5.7500e-03	Pu-242	5.0157e-08	U-235	4.2408e-05
Eu-154	5.9210e-03	Pu-244	1.4047e-10	U-236	2.5296e-06
H-3	2.8501e+00	Ra-226	1.2488e-03	U-238	1.9409e-03
I-129	2.5275e-06	Ra-228	8.0594e-07	Zr-93	7.3842e-06

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Lovelace (ITRI)

PTCSDSD Streams and Projected Disposed Volumes

As shown in Table 1-ITRI, the PTCSD data includes one MLLW stream planned for disposal.

Table 1-ITRI. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00321	MLLW-1	MLLW	Organic Liquids	COMM	73.00

Radiological Profile

ITRI reported one MLLW stream in the WMTDR. Isotopes, but not concentrations, were reported for the stream. Therefore, the 95MWIR was consulted for isotope data. ITRI reported four MLLW streams in the 95MWIR. Isotopes and concentrations were reported for two of these streams. The isotope profile applied to the PTCSD stream (see Table 3-ITRI) is based on a composite of these two streams (see Table 2-ITRI). The composite concentration for each isotope was calculated via Equation 2.

Table 2-ITRI. Isotope Profile Basis - Category 1 MLLW Streams

95MWIR Id	STP Id	Site Id	Stream Name
IT-W004	IT-W004	C-14, Tritium	C-14, TRITIUM LSC VIAL WASTE
IT-W005	IT-W005	C-14, Tritium	C-14, TRITIUM LSC BULK WASTE

Table 3-ITRI. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)
C-14	9.0000e-05
H-3	9.0000e-04

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Los Alamos National Laboratory (LANL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-LANL, the PTCSD data includes two LANL MLLW streams planned for disposal: both at off-site, commercial facilities.

Table 1-LANL. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
02419	LA-3	MLLW	Commercial Treatment Residues	COMM	2,123.10
02420	LAMC	MLLW	Treated Dewatered Sludges	COMM	13.00

Radiological Profile

Separate isotope profiles were developed for each of the two PTCSD streams based on data reported by LANL WMTDR. LANL reported 33 streams in the WMTDR data with isotopes and concentrations reported for all the streams. This data was essentially an update to their streams in the 95MWIR. The LANL PTCSD data (i.e., MLLW Disposition Map) provides a crosswalk to the 95MWIR streams. Given this crosswalk, stream-specific isotope profiles were developed. The isotope profile for stream LAMC, shown in Table 3a-LANL, is based on one stream reported to the WMTDR (see Table 2-LANL). The isotope profile for stream LA-3, shown in Table 3b-LANL, is a composite of 20 streams reported to the WMTDR (Table 2-LANL) with the composite concentration for each isotope calculated via Equation 2.

Table 2-LANL. Isotope Profiles Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name	Isotope Profile
LANL2027	LA-W096	LA-W928	LA-W928	Dewatered Sludge	LAMC
LANL2003	LA-W072	LA-W904	LA-W904	Soil With Metals	LA-3
LANL2005	LA-W074	LA-W906	LA-W906	Aqueous Organic Liquid	LA-3
LANL2006	LA-W075	LA-W907	LA-W907	Halogenated Organic Liquid	LA-3
LANL2007	LA-W076	LA-W908	LA-W908	Non-Halogenated Or Organic Liquid	LA-3
LANL2008	LA-W077	LA-W909	LA-W909	Bulk Oils	LA-3
LANL2012	LA-W081	LA-W913	LA-W913	Aqueous Wastes With Heavy Metals	LA-3
LANL2013	LA-W082	LA-W914	LA-W914	Corrosive Solutions	LA-3
LANL2014	LA-W083	LA-W915	LA-W915	Aqueous Wastes, Et. Al.	LA-3
LANL2015	LA-W084	LA-W916	LA-W916	Water Reactive Wastes	LA-3
LANL2016	LA-W085	LA-W917	LA-W917	Compressed Gas	LA-3
LANL2017	LA-W086	LA-W918	LA-W918	Compressed Gas	LA-3
LANL2019	LA-W088	LA-W920	LA-W920	Elemental Mercury	LA-3
LANL2020	LA-W089	LA-W921	LA-W921	Activated Or Inseparable Lead	LA-3
LANL2021	LA-W090	LA-W922	LA-W922	Non-Combustible Debris	LA-3
LANL2022	LA-W091	LA-W923	LA-W923	Inorganic Solid Oxidizers	LA-3
LANL2023	LA-W092	LA-W924	LA-W924	Lead Wastes - TBD	LA-3
LANL2024	LA-W093	LA-W925	LA-W925	Mercury Wastes	LA-3
LANL2025	LA-W094	LA-W926	LA-W926	Compressed Gases	LA-3
LANL2029	LA-W098	LA-W930	LA-W930	Surface Contaminated Lead	LA-3
LANL2030	LA-W099	LA-W931	LA-W931	Lead & Lead-Contaminated Soil	LA-3

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3a-LANL. MLLW Isotope Profile - PTCSD Stream LAMC

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ac-227	2.8686e-08	Eu-152	6.5484e-04	Pa-234M	2.1468e-06	Se-75	1.8603e-01
Ac-228	1.3841e-06	Eu-155	2.2324e-12	Pb-210	1.8120e-09	Sm-145	0.0000e+00
Ag-105	1.0902e-08	Fe-59	3.7207e-13	Pb-212	1.4883e-06	Sm-151	0.0000e+00
Ag-110M	1.8603e-01	Gross Alpha	1.5308e-04	Pb-214	1.0529e-08	Sn-113	1.8603e-01
Ag-111	7.4413e-12	Gross Beta	4.7483e-06	Po-210	1.7338e-09	Sr-85	3.7616e-05
Al-26	8.4879e-09	Gross Gamma	4.1233e-06	Po-212	4.9857e-07	Sr-89	3.7207e-13
Am-241	2.1145e-03	H-3	6.3140e+02	Po-214	1.0529e-08	Sr-90	4.5879e-05
Am-242	4.4648e-11	Hg-203	1.8603e-01	Po-216	7.7762e-07	Tc-95M	0.0000e+00
Am-243	1.3766e-07	I-125	0.0000e+00	Po-218	1.0381e-08	Tc-97	7.4413e-09
As-73	3.7207e-08	I-129	9.4505e-10	Pu-238	1.5657e-03	Tc-99	3.0915e-04
As-74	0.0000e+00	I-131	0.0000e+00	Pu-239	3.1298e-03	Te-132	0.0000e+00
Au-198	7.4413e-12	Ir-192	7.4413e-12	Pu-240	4.4648e-06	Th-228	1.4293e-06
Ba-133	5.3205e-09	K-40	2.8928e-07	Pu-241	6.6228e-05	Th-230	1.6785e-07
Ba-140	0.0000e+00	Kr-85	0.0000e+00	Pu-242	2.6082e-10	Th-231	2.7607e-07
Be-7	3.7998e-06	La-140	0.0000e+00	Pu-52	4.3160e-03	Th-232	9.3019e-02
Bi-207	3.7207e-09	MAP	4.8284e-04	Ra-224	7.7762e-07	Th-234	1.1759e-05
Bi-210	1.8120e-09	MFP	1.9742e-04	Ra-226	1.1649e-08	Tl-204	0.0000e+00
Bi-212	1.4325e-06	Mn-52	3.6090e-11	Ra-228	7.7762e-07	Tl-208	2.7979e-07
Bi-214	1.0529e-08	Mn-54	2.5639e-05	Rb-83	1.8603e-01	U-232	3.7207e-09
C-14	8.2281e-06	Mo-99	2.3701e-08	Rb-86	0.0000e+00	U-233	2.2696e-11
Cd-109	7.5901e-06	Na-22	3.5618e-05	Re-183	1.8603e-01	U-234	2.3350e-05
Ce-141	2.2324e-12	Nb-94	2.7012e-08	Rh-101	0.0000e+00	U-235	9.1383e-05
Ce-144	7.3695e-07	Nb-95	5.3957e-08	Rn-220	7.7390e-07	U-238	3.9894e-02
Co-56	4.3160e-11	Ni-59	4.5020e-05	Rn-222	1.0529e-08	U-239	7.4413e-11
Co-57	4.3215e-08	Np-237	4.7252e-07	Ru-103	7.9808e-07	V-48	7.4413e-12
Co-58	3.9067e-11	Np-239	1.3766e-07	Ru-106	3.4827e-07	Y-88	1.8603e-01
Co-60	1.0159e-04	NR	0.0000e+00	S-35	3.7207e-06	Y-90	0.0000e+00
Cs-134	1.2985e-09	Os-185	1.8603e-01	Sb-124	1.8603e-01	Y-91	0.0000e+00
Cs-137	1.0187e-04	P-32	2.3203e-04	Sb-125	0.0000e+00	Zn-65	1.7115e-09
Cu-67	1.7859e-06	Pa-233	7.7762e-09	Sc-46	4.1299e-05	Zr-95	7.9417e-06
DU	1.7897e-07	Pa-234	1.1274e-08				

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3b-LANL. MLLW Isotope Profile - PTCSD Stream LA-3

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ac-227	2.9640e-07	Eu-155	3.1716e-11	Pb-210	2.5743e-08	Sm-151	0.0000e+00
Ac-228	1.9664e-05	Fe-59	5.2860e-12	Pb-211	1.2206e-10	Sn-113	3.8443e+00
Ag-105	1.5488e-07	Gross Alpha	1.1981e-03	Pb-212	2.1144e-05	Sr-85	4.8636e-04
Ag-110M	3.8443e+00	Gross Beta	5.2775e-05	Pb-214	1.4959e-07	Sr-89	5.2860e-12
Ag-111	1.0572e-10	Gross Gamma	4.3660e-05	Po-210	2.4633e-08	Sr-90	3.7451e-04
Al-26	1.2062e-07	H-3	1.0679e+04	Po-212	7.0832e-06	Tc-95M	0.0000e+00
Am-241	4.1572e-02	Hg-203	3.8443e+00	Po-214	1.4959e-07	Tc-97	1.0572e-07
Am-242	8.2173e-10	I-125	2.4123e-06	Po-216	1.1048e-05	Tc-99	1.6373e-02
Am-243	1.9570e-06	I-129	1.9529e-08	Po-218	1.4748e-07	Te-132	0.0000e+00
As-73	5.2860e-07	I-131	0.0000e+00	Pu-238	2.5807e-02	Th-228	2.0293e-05
As-74	0.0000e+00	Ir-192	1.0572e-10	Pu-239	6.0358e-02	Th-230	2.4866e-06
Au-198	1.0572e-10	K-40	4.7185e-06	Pu-240	6.3432e-05	Th-231	3.9223e-06
Ba-133	7.5589e-08	Kr-85	0.0000e+00	Pu-241	9.4090e-04	Th-232	1.9222e+00
Ba-140	0.0000e+00	La-140	1.3167e-11	Pu-242	3.0714e-08	Th-234	1.6706e-04
Be-7	5.4012e-05	MAP	8.5540e-03	Pu-52	8.9189e-02	Tl-204	0.0000e+00
Bi-207	5.2860e-08	MFP	2.8970e-03	Ra-224	1.1048e-05	Tl-208	3.9750e-06
Bi-210	2.5743e-08	Mn-52	5.1274e-10	Ra-226	1.6759e-07	U-232	5.2860e-08
Bi-212	2.0351e-05	Mn-54	3.6428e-04	Ra-228	1.1048e-05	U-233	3.7290e-10
Bi-214	1.4961e-07	Mo-99	3.3672e-07	Rb-83	3.8443e+00	U-234	3.4579e-04
C-14	1.4868e-04	Na-22	4.5797e-04	Rb-86	0.0000e+00	U-235	1.1348e-03
Cd-109	1.0783e-04	Nb-94	5.6250e-07	Re-183	3.8443e+00	U-238	5.6692e-01
Ce-141	3.1716e-11	Nb-95	1.1150e-06	Rh-101	0.0000e+00	U-239	8.6498e-10
Ce-144	1.0469e-05	Ni-59	3.4887e-04	Rn-220	1.0995e-05	U-81	1.3359e-06
Co-56	8.1500e-10	Np-237	6.7229e-06	Rn-222	1.4959e-07	V-48	1.0572e-10
Co-57	5.5282e-07	Np-239	1.9558e-06	Ru-103	1.1687e-05	V-52	3.0755e-08
Co-58	5.5503e-10	Np-242	1.0091e-09	Ru-106	4.9291e-06	Y-88	3.8443e+00
Co-60	1.1529e-03	NR	0.0000e+00	S-35	6.7276e-05	Y-90	4.6132e-09
Cs-134	2.6833e-08	Os-185	3.8443e+00	Sb-124	3.8443e+00	Y-91	0.0000e+00
Cs-137	1.1348e-03	P-32	3.3044e-03	Sb-125	4.4210e-06	Zn-65	2.4344e-08
Cu-67	3.0899e-05	Pa-233	1.1048e-07	Sc-46	5.8674e-04	Zr-93	5.9203e-07
DU	1.3875e-06	Pa-234	1.6016e-07	Se-75	3.8443e+00	Zr-95	1.1318e-04
Eu-152	9.3125e-03	Pa-234M	3.0501e-05	Sm-145	0.0000e+00		

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Pantex Plant (PTX)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PTX, the PTCSD data includes two MLLW streams planned for disposal: both at off-site, commercial facilities.

Table 1-PTX. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01353	MLLW-2	MLLW	Stabilized Ops MLLW	COMM	1.00
01355	MLLW-3	MLLW	Treated Ops MLLW (from Comm)	COMM	393.40

Radiological Profile

A site-wide MLLW isotope profile for application to the two PTCSD streams was derived based on data reported by PTX in the 95MWIR. PTX reported 15 MLLW streams to the WMTDR. However, isotopes and concentrations were only reported for one of the streams. By comparison, the 95MWIR includes 24 PTX MLLW streams with isotopes and concentrations reported for 5 of the streams. The profile (see Table 3-PTX) is a composite of the five 95MWIR streams (see Table 2-PTX) with isotope data. The composite concentration for each isotope was calculated via Equation 2.

Table 2-PTX. Isotope Profile Basis - Category 1 MLLW Streams

95MWIR Id	STP Id	Site Id	Stream Name
PX-W010	PX-W010A		ASH, BURNING GROUNDS
PX-W020	PX-A020	W-8	SCINTILLATION FLUIDS
PX-W025	PX-W025	NA	METAL SCRAP CONTAMINATED
PX-W027	PX-W027	W-5	LEAD CONTAMINATED WASTE, SOLID
PX-W028	PX-W028	W-4	MERCURY CONTAMINATED SOLID

Table 3-PTX. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.8786e-09	Ra-228	2.1036e-07
Bi-214	8.2922e-08	Th-228	3.0309e-08
Cs-137	1.1275e-08	Th-230	3.7505e-08
H-3	1.0592e-02	Th-232	5.9132e-06
K-40	1.6599e-06	Th-234	4.1340e-07
Pb-212	8.3151e-08	Tl-208	1.4596e-07
Pb-214	6.9980e-08	U-234	5.1826e-08
Pu-239	4.7192e-09	U-235	5.4259e-09
Ra-226	1.8976e-07	U-238	1.3147e-06

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Sandia National Laboratories - New Mexico (SNLN)

PTCSD Streams and Projected Disposed Volumes

The PTCSD data includes seven MLLW streams planned for disposal (Table 1-SNLN). Four streams are destined for disposal commercially off-site and three streams to on- or off-site "to be determined" facilities.

Table 1-SNLN. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
02267	LMWTG9Y	MLLW	Macroencapsulated Inorganic Debris	TBD	110.00
02268	LMWTG3C	MLLW	Treated Sodium Uranium	TBD	3.00
02269	LMWTG22	MLLW	RMWMF Product - General	TBD	47.90
00612	LMWTG7,11-3	MLLW	Organic Liq.-Scintillation Cocktails	COMM	74.10
00618	LMWTG15	MLLW	Soils - Inventory	COMM	35.30
02270	LMWTG17C	MLLW	RMWMF Product - Septage	COMM	55.00
02276	LMWTG2.9	MLLW	Inorganic Debris	COMM	494.70

Radiological Profile

SNLN did not report to the WMTDR. Therefore, the 95MWIR was consulted for isotope data. SNLN reported 16 MLLW streams in the 95MWIR with isotope and concentrations reported for all the streams. The site-wide isotope profile (see Table 3-SNLN) is based on a composite of the 16 streams (see Table 2-SNLN). The composite concentration for each isotope was calculated via Equation 2.

Table 2-SNLN. Isotope Profile Basis - Category 1 MLLW Streams

95MWIR Id	STP Id	Site Id	Stream Name
SA-W193		TG 1	TG 1: INORGANIC DEBRIS WITH EXPLOSIVE COMPONENT
SA-W194		TG 2	TG 2: INORGANIC DEBRIS WITH WATER REACTIVE CONSTITUENT
SA-W195		TG 3	TG 3: REACTIVE METALS
SA-W196		TG 4	TG 4: ELEMENTAL LEAD
SA-W197		TG 5	TG 5: AQUEOUS LIQUIDS, CORROSIVES
SA-W198		TG 6	TG 6: ELEMENTAL MERCURY
SA-W199		TG 7	TG 7: ORGANIC LIQUIDS I
SA-W200		TG 8	TG 8: ORGANIC DEBRIS WITH ORGANIC CONTAMINANTS
SA-W201		TG 9	TG 9: INORGANIC DEBRIS WITH TCLP METALS
SA-W202		TG 10	TG 10: HETEROGENEOUS DEBRIS
SA-W203		TG 11	TG 11: ORGANIC LIQUIDS II
SA-W204		TG 12	TG 12: ORGANIC DEBRIS WITH TCLP METALS
SA-W205		TG 13	TG 13: OXIDIZERS
SA-W206		TG 14	TG 14: AQUEOUS LIQUIDS WITH ORGANIC CONTAMINANTS
SA-W207		TG 15	TG 15: SOILS WITH <50% DEBRIS
SA-W208		TG 16	TG 16: CYANIDE WASTE

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3-SNLN. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	2.8433e-06	K-40	2.7011e-12	Th-230	3.2698e-11
Cm-244	1.4216e-12	Kr-85	2.1325e-05	Th-231	3.8384e-12
Co-56	1.2368e-05	MAP	1.7060e-07	Th-232	4.6915e-07
Co-57	2.1433e-06	MFP	3.4141e-03	Th-234	5.2601e-12
Co-58	6.5396e-10	Mn-54	9.1653e-06	U	2.4168e-09
Co-60	2.5735e-06	Na-22	6.8239e-10	U-235	4.2664e-06
Cs-137	1.5183e-04	Na-24	1.4216e-05	U-238	5.9975e-04
Cs-137/Sb-125	4.2649e-06	Ni-63	2.8436e-02	U-natural	9.4824e-07
Fe-54	4.1228e-07	Ra-226	7.6771e-08	Zn-65	2.4168e-07
H-3	4.5493e-01	S-36	2.8433e-10		

Appendix D-1

Chicago Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Ames Lab (AMES)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-AMES, the PTCSD data includes three LLW streams targeted for disposal; all at Hanford.

Table 1-AMES. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00277	AMES-LLW-3	LLW	Asbestos, Sources	HANF	109.00
01128	LLW-1B	LLW	Recycled Metal Waste for Disposal	HANF	5.25
01129	LLW-2A	LLW	Incinerator Ash	HANF	3.60

Radiological Profile

The isotope profile for application to the three PTCSD streams was derived based on data reported to the WMTDR. AMES reported one LLW stream in the WMTDR data with a planned disposition of disposal at an off-site, commercial location. AMES reported isotopes, but not concentrations, for the stream. More consistent with the PTCSD data, Hanford reported two streams in the WMTDR data to represent off-site receipts from AMES. The quantities reported by Hanford to be received and disposed (130 M3) are in line with that reported by AMES in the PTCSD data (118 M3). Hanford reported isotopes and concentrations for both streams.

Considering the above, the AMES LLW site-wide isotope profile (see Table 3-AMES) was derived based on a composite of the two streams reported by Hanford in the WMTDR data (see Table 2-AMES). The composite concentration for each isotope was calculated via Equation 1.

Table 2-AMES. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
HANF1000	HLN97F_AME_CHLLW1_DR_S	Ames CH Cat1 LLW Solids in Drums
HANF1001	HLN97F_AME_CHLLW1_MB_S	Ames CH Cat1 LLW Solids in Med Boxes

Table 3-AMES. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.0006e-06	U-234	2.9983e-08
Ba-137m	6.6289e-06	U-238	6.0000e-04
Cs-137	7.0073e-06		

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Argonne National Laboratory - East (ANLE)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-ANLE, the PTCSD data includes six ANLE LLW streams planned for disposal. Three are targeted for disposal at off-site, commercial facilities and three are targeted for disposal at Hanford.

Table 1-ANLE. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01156	B3B	LLW	Compacted LLW to Comm	COMM	1,175.00
01158	B5B	LLW	Sorted LLW to Comm	COMM	293.00
01160	H1	LLW	Stabilized Evaporator Bottoms to Comm	COMM	73.00
01155	B3A	LLW	Compacted LLW to Hanford	HANF	10,429.00
01157	B5A	LLW	Sorted LLW to Hanford	HANF	2,277.00
01161	H2	LLW	Stabilized Evaporator Bottoms to Hanford	HANF	511.00

Radiological Profile

The isotope profile for application to the six PTCSD streams was derived based on data reported by ANLE to the WMTDR. ANLE reported one stream in this data (see Table 2-ANLE) with the planned disposition being disposal at Hanford. The site-wide isotope profile (see Table 3-ANLE) is based on the isotopes and concentrations reported for this stream.

Table 2-ANLE. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
ANLE0101		Solid NonHazardous Low Level Waste

Table 3-ANLE. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.0300e-03	K-40	2.6000e-08	Sr-90	1.9900e-03
Am-243	5.9700e-05	Ni-63	1.6400e-01	Tc-99	3.8600e-08
Ba-133	1.4700e-06	Np-237	2.7900e-05	Th-229	1.8200e-07
C-14	1.7500e-08	Pa-231	3.8600e-09	Th-230	3.6500e-07
Cm-243	1.0100e-04	Pu-238	1.6400e-04	Th-232	7.4400e-08
Cm-244	7.8000e-06	Pu-239	9.1200e-04	U-232	2.0800e-07
Co-60	1.6600e-02	Pu-240	1.5100e-03	U-233	1.1600e-06
Cs-137	4.1800e-03	Pu-241	2.3200e-03	U-234	4.2400e-05
Eu-152	3.5300e-08	Pu-242	1.9600e-06	U-235	5.9000e-07
Eu-154	1.9600e-05	Pu-244	3.2400e-08	U-236	4.9300e-08
H-3	3.0500e-01	Ra-226	4.3000e-06	U-238	7.1000e-05

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Brookhaven National Laboratory (BNL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-BNL, the PTCSD data includes two BNL LLW streams planned for disposal; both at Hanford.

Table 1-BNL. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01184	LLW-1A	LLW	Compacted LLW	HANF	586.00
01185	LLW-1B	LLW	Packaged LLW	HANF	16,627.00

Radiological Profile

The isotope profile for application to the two PTCSD streams was derived based on data reported by BNL to the WMTDR. BNL reported seven LLW streams in this data. Four were reported as planned for disposal, all at Hanford. Isotopes and concentrations were reported for all the streams. The BNL site-wide profile (see Table 3-BNL) is based on a composite of the four streams planned for disposal at Hanford (see Table 2-BNL). The composite concentration for each isotope was calculated via Equation 1.

Table 2-BNL. Isotope Profile Basis - Category 1 LLW Streams

WMTDRId	Site ID	Stream Name
BNL0012	BNL-R01	Dry Compactible Waste
BNL0014	BNL-R02	Dry Non-Compactible Waste
BNL0015	BNL-R03	Activated Metals
BNL0017	BNL-R08	Asbestos Waste

Table 3-BNL. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Co-56	2.7309e-04	Mn-58	2.0770e-04
Co-60	9.1888e-07	Rb-83	3.1548e-03
Cr-51	3.7540e-03	Rb-84	6.1259e-04
Cs-137	4.2693e-07	Rb-86	6.7598e-04
Ge-68	2.5616e-05	Zn-65	5.9853e-04
Mn-54	8.3265e-04		

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Princeton Plasma Physics Laboratory (PPPL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PPPL, the PTCSD data includes two PPPL LLW streams planned for disposal; both at Hanford.

Table 1-PPPL. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01233	LLW-3	LLW	Compacted Waste	HANF	1,813.60
01234	LLW-4	MLLW	Treated Non-Compactable MLLW	HANF	146.00

Radiological Profile

The isotope profile for application to the two PTCSD streams was derived based on data reported by PPPL to the WMTDR. PPPL reported three LLW streams in this data, all destined for disposal at Hanford. Isotopes and concentrations were reported for all three streams. The site-wide profile (see Table 3-PPPL) is based on a composite of these three streams (see Table 2-PPPL). The composite concentration for each isotope was calculated via Equation 1.

Table 2-PPPL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
PPPL0017	NA	Type A DMSBs
PPPL0018	NA	Compactable Waste
PPPL0020	NA	Non-Compactable Waste

Table 3-PPPL. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration Ci/M3
H-3	7.8490e+01

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Ames Lab (AMES)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-AMES, the PTCSD data includes one MLLW stream to be disposed, at an off-site commercial facility.

Table 1-AMES. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00274	AMES-MLLW-1	MLLW	Organic/Aqueous Mixture	COMM	1.46

Radiological Profile

The isotope profile for application to the PTCSD stream was derived based on data reported by AMES to the WMTDR. AMES reported one MLLW stream in this data (Table 2-AMES) with a planned disposition of off-site, commercial disposal. Isotopes and concentrations were reported for the stream. The isotope profile (see Table 3-AMES) is based on the data reported for this stream.

Table 2-AMES. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
AMES0004	NA		AL W008	Flammable, Corrosive Liquid

Table 3-AMES. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)
Th-232	1.9100e-04
U-238	9.0700e-04

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Argonne National Laboratory - East (ANLE)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-ANLE, the PTCSD data includes three ANLE MLLW streams planned for disposal. Two are targeted to off-site "to be determined" facilities and one is targeted to off-site, commercial disposal.

Table 1-ANLE. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01166	MLLW-22A	MLLW	Solidified Mixed Waste	COMM	29.60
01167	MLLW-23	MLLW	Sorted Mixed Waste to Comm	COMM	59.20
01174	MLLW-7A	MLLW	Amalgamated Mercury	TBD	0.40

Radiological Profile

A site-wide isotope profile for application to the three PTCSD streams was derived based on data reported by ANLE to the WMTDR. ANLE reported 22 MLLW streams in this data. The planned disposition of the streams was not reported. Isotopes and concentrations were reported for 21 of the 22 streams. The site-wide isotope profile (see Table 3-ANLE) is a composite of the 21 streams (see Table 2-ANLE) with the concentration for each isotope calculated via Equation 2.

Table 2-ANLE. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
ANLE0001	AE-W011			Acidic Wastewater with Metals
ANLE0002	AE-W012			Acidic Wastewaters without Metals
ANLE0003	AE-W013			MLLW Wastewater (with organics)
ANLE0004	AE-W014			MLLW Uncategorized Wastewater (toxic metals)
ANLE0005	AE-W015			Organic Solvents
ANLE0006	AE-W016			Evaporator/Concentrator Sludges
ANLE0008	AE-W018			Paint Chips
ANLE0009	AE-W020			Soil with Metals
ANLE0011	AE-W022			Soil Test Samples
ANLE0012	AE-W023			Inorganic Solids with Chromium
ANLE0013	AE-W024			Metal with RCRA metals
ANLE0014	AE-W026			Inorganic Solids with Cadmium
ANLE0017	AE-W030			Combustible Solids with Metals
ANLE0018	AE-W031			Combustible Solids with Organics
ANLE0019	AE-W033			Lead Shielding
ANLE0020	AE-W034			PPE Contaminated with Lead
ANLE0021	AE-W035			Stored Lead Waste
ANLE0022	AE-W043			Reactive Alkali Metals
ANLE0023	AE-W044			Elemental Mercury
ANLE0025	AE-W046			Inorganic Nitrates (U and Th)
ANLE0102				Low Level PCB Waste

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3-ANLE. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.1141e-02	Co-58	5.2326e-12	Np-237	2.2957e-05	Sr-90	1.4379e-04
Am-243	4.8016e-05	Co-60	3.0805e-03	Np-239	1.6471e-08	Tc-99	8.2897e-09
Ba-133	3.1341e-08	Cs-134	6.5406e-10	Pa-231	8.2710e-12	Th-228	1.7375e-06
Be-7	8.2710e-12	Cs-137	1.8368e-03	Po-210	8.6999e-09	Th-229	9.9408e-11
Bi-207	1.0307e-09	Eu-152	5.7787e-07	Pu-238	1.6509e-04	Th-230	1.5972e-07
Bi-208	4.9641e-07	Eu-154	7.5279e-07	Pu-239	6.7318e-04	Th-232	7.6133e-05
Bi-214	3.1481e-10	Fe-55	4.1388e-11	Pu-240	4.6466e-04	Th-234	6.1689e-08
C-14	4.7598e-07	Fe-59	2.7310e-08	Pu-241	5.5808e-02	U-232	1.3289e-08
Ca-45	2.0704e-05	H-3	7.8559e-04	Pu-242	3.0791e-07	U-233	4.6999e-07
Cd-109	3.3038e-11	K-40	9.1807e-05	Pu-244	1.1266e-05	U-234	1.4736e-05
Ce-144	2.0835e-11	Mn-54	9.0659e-10	Ra-226	9.5526e-06	U-235	1.2733e-05
Cm-243	1.7414e-05	Na-22	1.6565e-04	Rn-222	8.2776e-06	U-236	5.7915e-07
Cm-244	1.1179e-14	Nb-95	8.1650e-12	Se-79	8.2660e-09	U-238	2.0279e-04
Co-57	2.8166e-10	Ni-63	3.6012e-04	Sr-85	8.3007e-04		

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Brookhaven National Laboratory (BNL)

PTCSD Streams and Projected Disposed Volumes

The PTCSD data includes one MLLW stream planned for disposal, at an off-site commercial facility (Table 1-BNL.)

Table 1-BNL. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01191	MLLW-3A	MLLW	Packaged MLLW to Comm	COMM	80.43

Radiological Profile

The isotope profile for application to the PTCSD stream was derived based on data reported by BNL to the WMTDR. BNL reported nine MLLW streams in this data. Isotopes and activities (Ci) were reported for all nine streams. Eight of the streams were reported as planned for off-site treatment/disposal and one was reported as planned for treatment on-site. The isotope profile (Table 3-BNL) is a composite based on the streams planned for off-site treatment/disposal. Only six of the eight streams (Table 2-BNL) were considered in the composite as two of the streams were reported as having no inventory in storage (an inventory value was necessary to convert the isotope activities reported for each stream to concentrations). The composite concentration for each isotope was calculated via Equation 2.

Table 2-BNL. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
BNL0001	BN-W001		M21	Ignitable Liquids
BNL0003	BN-W003		M25	Reactive Waste
BNL0004	BN-W004		M26	Spent Solvents
BNL0006	BN-W006		M20	Lead Waste
BNL0007	BN-W007		M22	Inorganic Debris with Mercury Waste
BNL0010	BN-W011		M28	PCB Waste

Table 3-BNL. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ac-227	2.3753e-08	Cr-51	0.0000e+00	Na-22	8.4376e-07	Sn-117m	1.4252e-04
Ag-110	1.9881e-05	Cs-137	7.6010e-02	Nb-93m	2.3209e-05	Sr-85	1.6627e-11
Au-198	1.1876e-11	Cu-64	1.5202e-06	P-32	2.6520e-04	Sr-90	6.5083e-01
Ba-133	1.9002e-10	Fe-55	4.7506e-07	Rh-102	6.6508e-11	Tc-95m	4.7506e-12
Be-7	2.4738e-06	Ga-68	9.5012e-10	Ru-106	2.5487e-08	Tc-96	4.7506e-08
Bi	3.3254e-07	Ga-72	1.9715e-10	S-35	5.2449e-04	Th-228	1.9952e-05
Bi-207	3.8005e-11	Ge-68	9.5012e-06	Sb-124	1.2874e-06	Th-230	9.5012e-06
Bi-213	1.1496e-07	H-3	4.6561e-01	Sb-125	5.4645e-07	Th-231	2.6128e-08
C-14	4.9881e-06	Hg-203	2.3753e-07	Sc-44	7.9572e-10	Th-232	1.8052e-05
Cd-109	1.4993e-05	I-124	7.1259e-07	Sc-46	6.6990e-07	U-234	7.3159e-05
Ce-139	1.4727e-10	I-125	1.6627e-06	Se-75	1.1401e-07	U-235	3.8005e-06
Co-56	1.0143e-05	I-133	3.3254e-11	Sn-113	4.7506e-07	U-238	5.7245e-05
Co-57	2.3666e-05	K-40	2.1378e-11	Sn-113g	2.8029e-09	Y-88	3.3507e-07
Co-58	1.7176e-05	Mn-52	1.1876e-08	Sn-115	2.8504e-10	Zn-65	9.0971e-07
Co-60	1.1737e-05	Mn-54	1.2352e-05				

Appendix D-1

Idaho Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Idaho National Engineering and Environmental Laboratory (INEEL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-INEEL, the PTCSD data includes 17 INEEL LLW streams destined for disposal. Ten are targeted to disposal on-site and the remaining seven are targeted for disposal at "to be determined," off-site facilities.

Table 1-INEEL. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00788	AAW	LLW	RH DD LLW	INEL	359.45
00790	AAY [HLW]	LLW	CH DD LLW	INEL	18,715.00
00799	ABH	LLW	Incinerated LLW	INEL	4.43
00800	ABI	LLW	Incinerated LLW	INEL	17.00
00801	ABJ	LLW	Sized LLW	INEL	987.10
00803	ABL	LLW	Sized LLW	INEL	174.00
00804	ABM	LLW	Compacted LLW	INEL	2,190.40
00806	ABO	LLW	Compacted LLW	INEL	354.20
00811	ABT	HLW	HLW DD LLW	INEL	1,117.80
02069	ABN	MLLW	WROC Stabl Waste to RWMC	INEL	331.38
00787	AAV	LLW	RH DD LLW	TBD	687.80
00789	AAX	LLW	CH DD LLW	TBD	13,788.10
00798	ABG	LLW	Incinerated LLW	TBD	170.20
00802	ABK	LLW	Sized LLW	TBD	1,733.30
00805	ABN	LLW	Compacted LLW	TBD	3,572.40
00813	ABV	HLW	HLW DD LLW	TBD	3,148.20
00824	BC	TRU	Secondary LLW	TBD	721.00

Radiological Profile

A site-wide LLW isotope profile for application to the 17 PTCSD streams was derived based on data reported by the INEEL to the WMTDR. The INEEL reported 31 LLW streams in the WMTDR data. Sixteen of the streams were targeted for disposal, 14 on-site and 2 at off-site commercial facilities. The planned disposition for the remaining 15 streams was reported as treatment.

The site-wide isotope profile is a composite of the 16 streams targeted for disposal. These streams are shown in Table 2-INEEL (only 15 of the 16 streams are shown as isotope data was not reported for one of the streams). The isotope profile is shown in Table 3-INEEL. The composite concentration for each isotope was calculated via Equation 1.

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-INEEL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
INEL0401		Activated Metal Debris
INEL0402		Asbestos Debris
INEL0405		Biological Debris
INEL0406		Composite Filter Debris #1
INEL0408		Debris Compactible #1
INEL0410		Inorganic Homogeneous Solid #1
INEL0412		Liquid
INEL0414		Nonactivated Metal Debris #2
INEL0416		Organic Debris #1
INEL0417		Organic Debris #2
INEL0422		Sealed Sources #1
INEL0424		Soil/Gravel #1
INEL0425		Soil/Gravel #2
INEL0427		Solid #1
INEL0430		Solidified Homogeneous Solids #2

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3-INEEL. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ac-227	7.4491e-07	Eu-155	1.8155e-02	Np-237	1.1093e-05	Sr-89	2.6636e-03
Ag-108	7.5121e-06	Fe-55	3.0625e+01	Os-194	2.4979e-08	Sr-90	6.7782e-02
Ag-108m	8.6803e-05	Fe-59	3.2456e+01	Pm-147	3.8814e-02	Sr-91	3.0364e-05
Ag-110	1.1594e-04	Gd-153	4.2147e+00	Pr-144	4.9560e-02	Sr-92	1.2215e-05
Ag-110m	2.6723e-03	H-3	1.6688e+02	Pu-236	8.6197e-11	Ta-182	3.1450e+01
Am-241	1.9058e-04	Hf-175	1.3171e+01	Pu-238	5.8657e-05	Tc-99	8.3097e-05
Am-242m	9.2642e-08	Hf-181	7.0812e+00	Pu-239	1.6132e-04	Te-125m	4.4580e-01
Am-243	4.2790e-07	I-124	2.1393e-10	Pu-240	1.3341e-05	Te-132	2.0703e-06
Ar-39	4.4677e-05	I-129	9.8092e-06	Pu-241	4.9560e-04	Th-228	1.9732e-01
Ba-133	3.9055e-06	I-131	3.7474e-05	Pu-242	1.0583e-08	Th-229	5.9055e-08
Ba-137m	1.5423e-02	I-132	1.1465e-03	Ra-226	1.2584e-03	Th-230	6.5855e-07
Ba-140	6.2685e-04	I-133	1.0351e-05	Re-188	6.4179e-05	Th-232	1.5150e-04
Bi-210	1.9155e-08	In-113m	2.9133e-02	Rh-103m	6.0264e-06	Th-234	1.5426e-05
Br-82	7.6342e-06	Ir-192	1.1675e+00	Rh-106	2.4137e-02	U-232	7.2840e-07
C-14	1.3733e-02	K-40	1.2900e-03	Ru-103	5.7848e-03	U-233	2.9439e-06
Cd-109	7.5220e-05	Kr-85	3.5124e-05	Ru-105	2.7880e-04	U-234	1.8255e-05
Cd-113m	5.1424e-06	La-140	4.2845e-04	Ru-106	2.5640e-02	U-235	2.5893e-04
Ce-139	2.0703e-06	MAP	2.7416e+00	S-35	9.4815e-04	U-236	3.7701e-06
Ce-141	2.2426e-03	MFP	2.7419e+00	Sb-122	3.2227e-05	U-238	1.1173e-02
Ce-144	3.3266e-01	Mn-54	8.9397e+02	Sb-124	1.4054e-01	W-185	3.2560e+01
Cl-36	1.6900e-04	Mn-56	9.0127e-03	Sb-125	1.0326e+00	W-187	4.9036e+01
Cm-242	2.6056e-06	Mo-93	2.3605e-04	Sc-46	4.4999e-01	Y-88	2.2903e-05
Cm-243	1.1129e-07	Mo-99	1.0121e-04	Se-75	2.4397e-05	Y-90	2.4603e-02
Cm-244	1.4573e-05	Na-22	1.6238e-04	Sm-145	2.8444e-05	Y-91	1.9275e-03
Co-57	4.9562e-03	Na-24	1.8460e-03	Sm-151	5.0208e-03	Y-91m	1.4342e-23
Co-58	8.3654e+02	Nb-93m	1.9391e-02	Sn-113	1.9746e-01	Y-93	7.6394e-04
Co-60	4.8506e+02	Nb-94	8.6264e-04	Sn-117m	9.6114e-01	Zn-65	3.2652e+00
Cr-51	8.2627e+01	Nb-95	1.8141e+00	Sn-119m	1.2136e+01	Zr-93	7.4429e-04
Cs-134	8.1091e-01	Nb-95m	5.6931e-03	Sn-121m	3.3603e-03	Zr-95	9.2657e-01
Cs-137	1.3061e+00	Ni-59	2.6057e+00	Sn-123	3.0783e-04	Zr-Nb-95	4.2801e-01
Eu-152	3.9849e-01	Ni-63	9.2512e+01	Sr-85	5.2187e-02		
Eu-154	3.0839e-02						

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Idaho National Engineering and Environmental Laboratory (INEEL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-INEEL, the PTCSD data includes seven INEEL MLLW streams planned for disposal; all targeted to off-site commercial facilities.

Table 1-INEEL. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
02070	ABO	MLLW	WROC Stabl Waste to Sub C Disposal	COMM	290.52
02072	ABQ	MLLW	RH-LLW from HLW RH Immobilization to Sub C Disposal	COMM	420.60
02073	ABR	MLLW	MLLW from AMWTP to Sub C Disposal	COMM	1,231.20
02074	ABS	MLLW	WROC Macro Debris to Sub C Disposal	COMM	540.30
02084	ACC	MLLW	Treated Debris to Sub C Disposal	COMM	137.11
02086	ACE	MLLW	Macroencapsulated Lead to Sub C Disposal	COMM	556.70
02087	ACF	MLLW	Stabilized WERF Ash to Sub C Disposal	COMM	290.16

Radiological Profile

A site-wide isotope profile for application to the seven PTCSD streams was derived based on data reported by the INEEL to the WMTDR. INEEL reported 124 MLLW streams in this data. Isotopes and concentrations were reported for 44 of the streams. The isotope profile (Table 3-INEEL) is a composite of these 44 streams (Table 2-INEEL). The composite concentration for each isotope was calculated via Equation 2.

Table 2-INEEL. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
INEL0080	IN-W004	IN-A004A	ID-CFA-732	CONTAMINATED GROUNDWATER SAMPLES
INEL0081	IN-W005	IN-A005A	ID-CFA-734	XYLENE, ALIQUOT 336 WITH PERCHLORATE
INEL0082	IN-W007	IN-A007A	ID-CFA-103	LIQUID LAB WASTE W/ METALS AND ORGANICS
INEL0083	IN-W008	IN-A008A	ID-CFA-107	ARA-IV SUMP SLUDGE
INEL0086	IN-W018	IN-A018A	ID-CFA-121	HEAVY METAL LIQUID LAB WASTES
INEL0088	IN-W020	IN-A020A	ID-TAN-126	HTRE-3 SPILL CLEANUP MATERIAL
INEL0089	IN-W021	IN-A021A	ID-TRA-127	TRA SCINTILLATION COCKTAILS (ALPHA <10)
INEL0094	IN-W035	IN-A035A	ID-TRA-157	TRA WARM WASTE POND SAMPLES
INEL0095	IN-W037	IN-A037A	ID-TAN-161	TAN TCLP SLUDGE (TCE, PCE)
INEL0098	IN-W041	IN-A041A	ID-TAN-170	IET LIQUID WASTE
INEL0099	IN-W042	IN-A042A	ID-INL-187	SIG SODIUM
INEL0100	IN-W043	IN-A043A	ID-TAN-188	TURCO DECON SOLUTION (UNUSED)
INEL0101	IN-W046	IN-A046A	ID-TAN-209	TURCO DECON (OXIDIZER)
INEL0103	IN-W048	IN-A048A	ID-PBF-212	Pb AND Cd CONTAMINATED SOIL
INEL0104	IN-W049	IN-A049A	ID-INL-213	MERCURY CONTAMINATED DEBRIS & ASBESTOS
INEL0108	IN-W058	IN-A058A	ID-TRA-253	CADMIUM FUEL GRID
INEL0109	IN-W059	IN-A059A	ID-TAN-254	HTRE-III TREATMENT SLUDGE
INEL0110	IN-W060	IN-A060A	ID-RWM-255	MERCURY CONTAMINATED SOIL
INEL0111	IN-W061	IN-A061A	ID-CFA-256	METHANOL SOLUTION
INEL0112	IN-W064	IN-A064A	ID-CFA-259	RADIOACTIVE PCB OIL W/ TCLP ORGANICS
INEL0113	IN-W066	IN-A066A	ID-PBF-261	WERF BAGHOUSE BAGS (TEFLON)
INEL0116	IN-W071	IN-A071A	ID-INL-266	WERF MONITOR DEBRIS
INEL0117	IN-W072	IN-A072A	ID-INL-267	PWTU SPENT FILTERS
INEL0119	IN-W074	IN-A074A	ID-TRA-269	ELECTRONIC BOARD & MISC. MACHINERY PARTS

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-INEEL. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
INEL0121	IN-W076	IN-A076A	ID-IRC-271	BIOPROCESSING MIXED WASTE
INEL0122	IN-W077	IN-A077A	ID-PBF-272	URANIUM SPIKES AND LEAD
INEL0123	IN-W078	IN-A078A	ID-PBF-274	WERF FLY ASH
INEL0124	IN-W079	IN-A079A	ID-PBF-275	WERF BOTTOM ASH
INEL0129	IN-W093	IN-A093A	ID-INL-289	MISC. LABORATORY WASTES
INEL0130	IN-W096	IN-A096A	ID-PBF-292	FREON SYSTEM WASTE - LIQUID
INEL0153	IN-W148	IN-A148A	ID-SMC-149A	SPENT GM 141 SAPC SOLVENT
INEL0155	IN-W151	IN-A151A	NR-NRF-117	CADMIUM SHEETS
INEL0241	IN-W377	IN-A377A	ID-PBF-297	TREATABILITY STUDY RESIDUES
INEL0242	IN-W378	IN-A378A	ID-TRA-294	SOLVENT CONTAMINATED RAGS
INEL0243	IN-W379	IN-A379A	ID-TRA-128	LABORATORY EQUIPMENT AND DEBRIS
INEL0248	IN-W384	IN-A384A	ID-RWM-508	EQUIPMENT PIT DECON WASTE
INEL0249	IN-W385	IN-A385A	ID-TAN-502	ISV HEPA FILTERS
INEL0250	IN-W386	IN-A386A	ID-SMC-507	EUTECTIC SALT WITH LEAD (Pb)
INEL0259	IN-W397	IN-A397A	ID-SMC-528	CADMIUM CONTAMINATED MOP WATER
INEL0270	IN-W415	IN-A415	ID-CFA-551	HDEHP/HEPTANE EXTRACTANT
INEL0276	IN-W435	IN-A435	NR-NRF-665	PAINT CHIPS W/ PCB AND RCRA CONSTITUENTS
INEL0277	IN-W436	IN-A436	ID-TAN-666	PCB CONTAMINATED DEBRIS

Table 3-INEEL. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ag-108	5.5358e-08	Eu-154	5.4985e-05	Np-237	2.5364e-06	Se-75	0.0000e+00
Ag-108m	2.1809e-09	Eu-155	1.1312e-07	P-32	0.0000e+00	Sr-90	2.4271e-04
Ag-110	5.3176e-05	Fe-55	1.4130e-05	Pa-233	5.7131e-07	Th-228	1.8166e-08
Am-241	5.1253e-06	Gd-153	7.7265e-07	Pa-234	7.5444e-07	Th-230	3.4808e-08
Bi-214	9.3455e-05	H-3	8.7146e-06	Pa-234m	4.7962e-08	Th-232	3.4892e-08
C-14	0.0000e+00	Hf-181	3.9523e-06	Pb-210	6.8283e-11	Th-234	5.2950e-07
Ce-141	1.4115e-05	I-125	0.0000e+00	Pb-212	7.5822e-05	Ti-208	1.0932e-04
Ce-144	2.9453e-05	I-131	0.0000e+00	Pb-214	1.0580e-04	U-232	7.0532e-11
Cm-244	2.4288e-08	Ir-192	8.1721e-06	Pu-238	8.7671e-07	U-233	1.8544e-07
Co-58	5.9433e-06	K-40	3.5332e-04	Pu-239	7.0335e-07	U-234	2.6631e-04
Co-60	8.7581e-03	MAP	4.9841e-03	Ra-226	7.2101e-08	U-235	5.7915e-08
Cr-51	1.4462e-03	MFP	9.4208e-03	Ru/Rh-106	5.3793e-06	U-238	1.5650e-04
Cs-134	1.2321e-03	Mn-54	5.6401e-07	Ru-106	5.4082e-08	Y-88	0.0000e+00
Cs-137	1.0340e-01	Na-22	4.2709e-08	S-35	0.0000e+00	Zn-65	2.7657e-05
DU	3.4407e-04	Nb-95	7.6465e-07	Sb-125	1.4369e-03	Zr-95	3.7131e-07
Eu-152	3.8856e-06	Ni-63	6.6794e-06				

Appendix D-1

Nevada Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Nevada Test Site (NTS)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-NTS, the PTCSD data includes one, NTS-generated LLW stream planned for disposal (on-site).

Table 1-NTS. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01040		LLW	Cotter Concentrate Trash & PPE	NTS	368.00

Radiological Profile

The isotope profile for application to the PTCSD stream was derived based on data reported by NTS to the WMTDR. NTS reported two LLW streams in this data, both to be disposed on-site. Tritium was the only isotope reported for each stream. The tritium concentration was only reported for one of the streams. As such, the isotope profile (see Table 3-NTS) is based on this one stream (see Table 2-NTS).

Table 2-NTS. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
NTS0018	N/A	UGTA LLW - Compactible

Table 3-NTS. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration Ci/M3
H-3	4.4000e-06

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-NTS, the PTCSD data includes four NTS MLLW streams planned for disposal.

Table 1-NTS. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01198	MLLW-11	MLLW	Treated Pb and B. Burn Soils	TBD	0.00
01199	MLLW-12	MLLW	Treated Lead & Area 6 Lead	TBD	0.00
02148	MLLW-13	MLLW	Treated Area 6 Decon & Bldg 650 Leachfield	TBD	0.00
01050	MLLW-7	MLLW	Cotter Concentrate	NTS	0.06

Radiological Profile

The four PTCSD streams correlate well with streams reported by NTS in the 95MWIR and updated in the WMTDR. Therefore, separate isotope profiles for application to each of the four PTC streams were derived. The isotope profiles for the PTC streams MLLW-11, MLLW-12 and MLLW-13 are based on profiles reported for similar streams in the WMTDR. The isotope profile for MLLW-7 is based on a composite of two streams reported in the 95MWIR which were not updated in the WMTDR, with the concentration of each isotope derived using Equation 2. The streams used to derive the isotope profiles are listed in Table 2-NTS while the profiles are shown in Tables 3a-NTS through 3d-NTS.

Table 2-NTS. Isotope Profiles Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name	Isotope Profile
NA	NT-A009	NT-A009	LRY5MWNTSMW11 MEF016	COTTER CONCENTRATE (POPULATION A - 1236 DRUMS)	MLLW-7
NA	NT-B009	NT-B009	LRY5MWNTSMW11 MEF291	COTTER CONCENTRATE (POPULATION B - 7 DRUMS)	MLLW-7
NTS0010	NT-W019		LRY5MWNTSMW11	Lead Soil	MLLW-11
NTS0011	NT-W020	NT-W020A	LRY5MWNTSMW11	Bulk Lead	MLLW-12
NTS0008	NT-W017			Area 6 Decon Pond Samples	MLLW-13

Table 3a-NTS. Isotope Profile - PTCSD Stream MLLW-7

Isotope	Concentration (Ci/M3)
Pa-231	1.2889e-04
Th-230	8.0526e-01
U-238	3.8913e-02

Table 3b-NTS. Isotope Profile - PTCSD Stream MLLW-11

Isotope	Concentration (Ci/M3)
Cs-137 Gamma	1.2980e-06
Th-232	2.0008e-06

Table 3c-NTS. Isotope Profile - PTCSD Stream MLLW-12

Isotope	Concentration (Ci/M3)
Cs-137 Gamma	5.9011e-06
Pu-239/Pu-240	5.9011e-06

Table 3d-NTS. Isotope Profile for PTC Stream MLLW-13

Isotope	Concentration (Ci/M3)
Am-241 Gamma	8.5000e-07
Cs-137 Gamma	3.0000e-05

Appendix D-1

Oakland Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER Disposed by WM

Lawrence Berkeley National Laboratory (LBNL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-LBNL, the PTCSD data includes six LBNL LLW streams planned for disposal. Five are targeted for disposal to off-site commercial facilities and one is targeted for disposal to Hanford.

Table 1-LBNL. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disp (M3)
01729	AA1	LLW	Scint/Organic Liquids	COMM	74.70
01732	AB1	LLW	Combustible Solids	COMM	518.90
01735	AC1	LLW	Combustible/Non-Combustible Debris	COMM	70.30
01740	AEA1	LLW	[Compacted] Compactible Debris	COMM	10.38
01747	BAA	MLLW	[Neutralized] Aqueous Liquids (Commercial)	COMM	0.00
01742	AF1	LLW	LLW Tritiated Water on Gel, Metal (Activated & Non), Soil & Gravel	HANF	434.30

Radiological Profile

A site-wide isotope profile for application to the six PTCSD streams was derived based on data reported by LBNL to the WMTDR. LBNL reported 10LLW streams in this data. Seven were reported as planned for disposal, six at Hanford and one at a commercial location. The remaining three were reported as planned for treatment. Isotopes and concentrations were reported for five of the seven streams planned for disposal. The isotope profile (see Table 3-LBNL) is based on a composite of these five streams (see Table 2-LBNL). The composite concentration for each isotope was calculated via Equation 1.

Table 2-LBNL. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name
LBNL0031		Inorganic Aqueous Liquids
LBNL0035		Tritiated Water on Silica Gel
LBNL0036		Noncombustible, Compactible Debris
LBNL0037		Mixture of Combustible and Noncombustible Debris
LBNL0038		Contaminated Equipment/Metals/Hardware

Table 3-LBNL. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	2.8332e-05	Cs-137	3.3431e-03	Pu-238	1.5180e-05
Am-243	1.4641e-08	Fm-252	3.0725e-11	Pu-239	1.1949e-05
Bi-210	2.0203e-10	H-3	8.5136e+01	Ra-226	5.8925e-10
Bk-249	4.0688e-06	I-125	5.9526e-04	Th-229	3.0936e-10
C-14	1.6828e-04	Np-237	6.3007e-07	Th-232	3.0970e-05
Cf-249	2.6868e-05	Pa-231	4.6298e-11	U-233	2.0151e-06
Cf-252	4.0747e-06	Pb-210	1.4240e-06	U-234	4.5650e-10
Cm-246	5.3966e-09	Po-211	3.0725e-11	U-235	1.7257e-09
Cm-248	2.6907e-06	Pu-237	4.5457e-09	U-238	1.7578e-07

Category 1 MLLW Streams: Generated by Sources Other than ER Disposed by WM

Energy Technology Engineering Center (ETEC)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-ETEC, the PTCSD data includes two ETEC MLLW streams planned for disposal, at "to-be-determined" facilities.

Table 1-ETEC. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01683	BG	MLLW	Corrosive Cleaning Liquids Neutralized Acid Cleaner, Acidic Aqueous Liquid	TBD	0.01
02125	BK	MLLW	Wastewater Evaporation Residues	TBD	0.00

Radiological Profile

The isotope profile for application to the two PTCSD streams was derived based on data reported by ETEC to the WMTDR. ETEC reported nine MLLW streams in this data. Three of these streams, shown in Table 2-ETEC, correlate directly with the two PTC streams. The isotope profile, shown in Table 3-ETEC, is a composite of the profiles reported for these three streams. Because the stored inventory for all of the streams was zero, a weighted average composite could not be calculated. Therefore, the concentrations shown in Table 3-ETEC are the highest reported for each unique isotope across the three streams.

Table 2-ETEC. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
ETEC0008	ET-W029			Corrosive Cleaning Liquid
ETEC0009	ET-W030			Neutralized Acid Cleaner (Solidified)
ETEC0010	ET-W031			Acidic Aqueous Liquid

Table 3-ETEC. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)
Co-60	1.8200e+00
Cs-137	2.8000e-03
Pu-238	1.3600e-04
Pu-239	9.1500e-05
Sr-90	4.0300e-06
Th-230	1.4000e-04

Category 1 MLLW Streams: Generated by Sources Other than ER Disposed by WM

General Atomics (GA)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-GA, the PTCSD data includes two GA MLLW streams planned for disposal.

Table 1-GA. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01716	BF	MLLW	Organic Liquids	COMM	0.09
01718	BH	MLLW	Lead Shot	COMM	0.46

Radiological Profile

A site-wide isotope profile for application to the two PTCSD streams was derived based on data reported by GA to the 95MWIR (GA was not required to report to the WMTDR). GA reported 18 MLLW streams in the 95MWIR (Table 2-GA). Isotopes, but no concentrations, were reported for all 18 streams. The isotope profile, shown in Table 3-GA, is a composite of the unique isotopes reported across the 18 95MWIR streams.

Table 2-GA. Isotope Profile Basis - Category 1 MLLW Streams

95MWIR Id	STP Id	Site Id	Stream Name
GA-W003	GA-W003	GA-W003	SVA: LEAD CONTAMINATED SLUDGE
GA-W007	GA-W007	GA-W007	LEAD SHOT (HOT CELL FACILITY D&D)
GA-W009	GA-W009	GA-W009	HOT CELL D&D: CAUSTIC DECONTAMINATION SOLUTION
GA-W010	GA-W010	GA-W010	HOT CELL D&D: PUMP OIL
GA-W013	GA-W013	GA-W013	HOT CELL D&D: LEAD BRICKS
GA-W014	GA-W014	GA-W014	HOT CELL D&D: MISCELLANEOUS SCRAP METAL
GA-W025	GA-W025	GA-W025	SVA: LEAD SCRAP
GA-W028	GA-W028	GA-W030	NPR: HEPA FILTERS
GA-W031	GA-W031		OILY DEBRIS CONTAINING TCE
GA-W034	GA-W034		FUSION (DOUBLET): ALCOHOL AND TRITIUM
GA-W035	GA-W035		FUSION (DOUBLET): OIL AND TRITIUM
GA-W036	GA-W036		HOT CELL D&D: HEPA FILTERS
GA-W037	GA-W037		HOT CELL D&D: SOLID WASTES CONTAMINATED WITH F-LISTED SOLVENTS
GA-W038	GA-W038		HOT CELL D&D: MISCELLANEOUS LIQUID SOLVENTS
GA-W039	GA-W039		HOT CELL D&D: CORROSIVE LIQUIDS
GA-W040	GA-W040		HOT CELL D&D: ELECTRICAL COMPONENTS WITH LEAD SOLDER
GA-W041			NPR (LITHIUM TARGET TECHNOLOGY PROGRAM): WASTE COLUMN LIQUID WASTES - IPA/AMMONIA/NITRIC ACID
GA-W042			NPR (LITHIUM TARGET TECHNOLOGY PROGRAM): FUME SCRUBBER WASTES - SPENT NAOH SOLUTION CONTAINING CHROMIUM

Table 3-GA. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Co-60		Th-232	
Cs-134		U-234	
Cs-137		U-235	
H-3		U-236	
Sb-125		U-238	

Category 1 MLLW Streams: Generated by Sources Other than ER Disposed by WM

Lawrence Berkeley National Laboratory (LBNL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-LBNL, the PTCSD data includes ten LBNL MLLW streams planned for disposal. Nine are targeted to off-site commercial facilities and one is targeted to an off-site "to be determined" facility.

Table 1-LBNL. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01762	BLA	MLLW	[Treated] Tritiated Water on Gel	TBD	0.00
01749	BB3	MLLW	Aqueous Liquids (to Commercial after FY35)	COMM	28.00
01751	BC3	MLLW	Lab-Packed Oxidizers, Debris, Vermiculite with Oil (Comm after FY35)	COMM	13.30
01753	BD3	MLLW	Organic Liquids/Scint. Vials (Comm after FY35)	COMM	32.17
01755	BF	MLLW	Organic Liquids/Scint. Vials (Commercial)	COMM	70.66
01756	BG	MLLW	Elemental Lead	COMM	19.74
01763	BM	MLLW	Elemental Mercury	COMM	18.86
01765	BN2	MLLW	Basic Solids/Solutions w/Metals & Solvents, Debris, Scint. Vials, Lab Packed Oxidizers, Cement	COMM	13.65
01766	BO	MLLW	Acidic Aqueous Liquids (Commercial)	COMM	3.05
02261	BP2	MLLW	Acidic Aqueous Liquids (Commercial)	COMM	1.40

Radiological Profile

A site-wide isotope profile for application to the 10 PTCSD streams was derived based on data reported by LBNL to the WMTDR. LBNL reported 20 MLLW streams in this data. Isotopes were reported for 14 of the 20 streams. Isotope concentrations, however, were not reported (concentrations were not reported in the 95MWIR either). The isotope profile, shown in Table 3-LBNL, is a composite of the unique isotopes reported across the 14 streams (see Table 2-LBNL).

Table 2-LBNL. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
LBNL0001	LB-W001			Acidic Aqueous Liquids - Low Alpha
LBNL0002	LB-W002			Basic Aqueous Liquids - Low Alpha
LBNL0004	LB-W004			Organic Liquids - Low Alpha
LBNL0005	LB-W005			Elemental Lead
LBNL0006	LB-W006			Induced Mercury Waste
LBNL0007	LB-W007			Lab-Packed Organic Liquids - Low Alpha
LBNL0008	LB-W008			Lab-Packed Oxidizers - Low Alpha
LBNL0009	LB-W009			Predominantly Organic Debris - Low Alpha
LBNL0010	LB-W011			Acidic Solids w/Metals - High Alpha
LBNL0011	LB-W012			Basic Solids w/Metals - High Alpha
LBNL0013	LB-W014			Organic Liquids - High Alpha
LBNL0014	LB-W017			Lab-Packed Organic Liquids - High Alpha
LBNL0015	LB-W018			Lab-Packed Oxidizers - High Alpha
LBNL0016	LB-W019			Predominantly Organic Debris - High Alpha

Category 1 MLLW Streams: Generated by Sources Other than ER Disposed by WM

Table 3-LBNL. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ag-110		Cm-248		Mo-99		Rb-86	
Am-241		Co-57		Na-22		S-35	
Am-243		Co-60		Np-237		Sm-147	
Ba-133		Cs-137		P-32		Sr-90	
Ba-140		Es-254		Pa-231		Ta-182	
Be-7		Eu-152		Pa-233		Tc-99	
Bi-207		Fe-59		Pb-210		Th-229	
Bk-249		Ge-68		Pu-237		Th-232	
C-14		H-3		Pu-238		U-233	
Ce-144		I-125		Pu-239		U-235	
Cf-249		K-40		Pu-242		U-238	
Cm-244		La-140		Ra-226		Zr-95	
Cm-245		Mn-54					

Category 1 MLLW Streams: Generated by Sources Other than ER Disposed by WM

Lawrence Livermore National Laboratory (LLNL)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-LLNL, the PTCSD data includes two LLNL MLLW streams planned for disposal, both targeted to off-site, commercial facilities.

Table 1-LLNL. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01822	BA	MLLW	Solid	COMM	1,024.66
02417	BE3	MLLW	Debris	COMM	469.00

Radiological Profile

The two PTCSD streams correlate well with streams reported by LLNL in the 95MWIR and updated in the WMTDR. Therefore, separate isotope profiles for application to each of the PTCSD streams were derived. Each profile was derived based on composites of several streams reported in the WMTDR with the isotope concentrations calculated using Equation 2. The WMTDR streams used to derive the isotopes profiles are listed in Table 2-LLNL while the profiles are shown in Tables 3a-LLNL and 3b-LLNL.

Table 2-LLNL. Isotope Profiles Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name	Isotope Profile
LLNL0002	LL-W002		NA	Inorganic Sludges/Particulates	BA
LLNL0005	LL-W005		NA	Inorganic Sludges/Particulates	BA
LLNL0010	LL-W010		NA	Soils	BA
LLNL0018	LL-W023		NA	Soil with Debris	BA
LLNL0020	LL-W025		NA	Cemented Solids	BA
LLNL0003	LL-W003		NA	Inorganic Debris	BE3
LLNL0006	LL-W006		NA	Inorganic Debris	BE3
LLNL0013	LL-W015		NA	Inorganic Debris	BE3
LLNL0015	LL-W017		NA	Heterogeneous Debris	BE3
LLNL0016	LL-W021		NA	Lab Packs with Metals	BE3
LLNL0019	LL-W024		NA	Liquid Mercury	BE3

Table 3a-LLNL. MLLW Isotope Profile - PTCSD Stream BA

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.3476e-02	Eu-149	4.9722e-07	P-32	2.0061e-04	Sr-90	6.5260e-02
C-14	1.0830e-05	Eu-152	2.4073e-06	Pu-239	1.6770e-01	Th-228	1.7978e-05
Cd-109	1.1847e-07	Eu-155	5.3299e-08	Pu-242	0.0000e+00	Th-232	1.0045e-05
Ce-144	3.5130e-05	H-3	2.4026e-02	Ra-226	3.6345e-04	Th-234	4.3435e-03
Co-57	2.6522e-06	K-40	1.1261e-04	Ra-228	3.2610e-05	U-235	2.3613e-05
Co-60	2.1478e-04	MFP	3.3231e-01	Ru-106	4.3661e-05	U-238	7.4140e-03
Cs-134	5.3321e-05	Mn-54	5.2496e-05	S-35	1.9911e-06	W-181	3.9821e-10
Cs-137	2.1296e-03	Nb-95	4.1084e-05	Sb-125	4.0005e-05	Zr-95	5.2859e-05

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Oak Ridge Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Oak Ridge Reservation (ORR)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-ORR, the PTCSD data includes 18 ORR LLW streams planned for disposal. Seven of these are targeted for disposal at "to be determined" off-site facilities. The remaining 11 are targeted for disposal at "to be determined" on- or off-site facilities.

Table 1-ORR. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00265	DAI	SNF	Low-level Waste to Interim Storage	TBD	0.00
01586	DBH	LLW	DAW Volume Reduction Residues	TBD	152,170.80
01588	DBJ	LLW	Construction Debris	TBD	5,701.20
01589	DBK	LLW	Soils	TBD	37,463.60
01590	DBL	LLW	Non-Reg Chem/Lab Packs	TBD	9,647.14
01591	DBM	LLW	Resins/Trapping Material	TBD	69.10
01603	DBV	LLW	Scrap Metal Treatmt Residuals	TBD	5,038.76
01608	DCM	LLW	Uranium Oxide	TBD	1,054.60
01609	DCJ	LLW	Fissile-Disposal Ready	TBD	23.20
01610	DCD	LLW	CLASSIFIED-Disposal Ready	TBD	1,362.20
01611	DCE	LLW	Contact Handled-Disposal Ready	TBD	100.20
01582	DBS	LLW	WETF Sludge	TBD	6,526.00
01584	DBF	LLW	MVST Monoliths	TBD	1,252.30
01596	DBT	LLW	CPCF Sludge	TBD	4,342.01
01597	DBU	LLW	PWTC Sludge	TBD	14,865.97
01606	DCC	LLW	MVST Treated Concentrate (final)	TBD	1,628.00
01612	DCF	LLW	RH Post-Treatment	TBD	899.00
01613	DCG	LLW	RH Aluminum	TBD	10.00

Radiological Profile

A site-wide isotope profile for application to the 18 PTCSD streams was derived based on data reported by ORR to the WMTDR. ORR reported six LLW streams in this data. Isotopes and concentrations were reported for all six streams. The planned disposition for two of the streams was reported as disposal with the location "to be determined". The planned disposition for the remaining four was reported as treatment (presumably, any LLW residues from treatment of these streams are accounted for within the two streams destined for disposal). The isotope profile (see Table 3-ORR) was derived based on a composite of the two LLW streams (see Table 2-ORR) reported as destined for disposal. The composite concentration for each isotope was calculated via Equation 1.

Table 2-ORR. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
ORR1001		LLW Process Residues Project Rollup
ORR1002		LLW Dry Active Waste Project Rollup

Table 3-ORR. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ac-225	1.3418e-06	Ho-166m	3.7572e-13	Ra-228	1.0148e-05
Ac-227	3.4592e-06	I-125	1.7010e-04	Re-186	1.1387e-03
Ag-108m	3.9605e-06	I-129	6.4736e-08	Re-188	1.2216e-03
Ag-110m	1.0678e-04	I-131	3.1692e-04	Ru-106	6.4987e-08

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3-ORR. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	3.1021e-05	In-114	3.6498e-07	S-35	2.5404e-04
Am-243	4.4494e-05	In-114m	1.3250e-07	Sb-124	1.5382e-04
Am-244	2.4229e-06	Ir-192	5.8911e-04	Sb-125	2.5259e-07
Ba-133	4.5517e-04	Ir-194	5.2473e-08	Sc-46	4.1304e-05
Ba-140	4.4831e-09	K-40	1.2588e-05	Se-75	5.9940e-07
C-14	2.8346e-04	Kr-85	1.7881e+01	Sm-151	4.3734e-09
Cd-109	1.4495e-08	La-140	6.4070e-05	Sn-117m	1.4697e-06
Ce-141	1.2004e-05	Mn-54	4.1831e-01	Sr-85	8.5704e-06
Ce-144	9.6648e-04	Mo-99	7.8365e-05	Sr-89	3.1120e-03
Cf-249	0.0000e+00	Na-22	1.4013e-08	Sr-90	1.5080e-02
Cf-252	5.5660e-10	Na-24	5.8219e-05	Ta-182	3.3580e-07
Cl-36	6.8144e-04	Nb-95	2.2480e-06	Tb-160	5.0628e-09
Cm-244	1.6925e-02	Ni-59	9.3189e-07	Tc-99	1.6896e-06
Co-57	7.8068e-06	Ni-63	3.8010e+00	Th-227	3.4592e-06
Co-58	5.4466e-04	Np-237	1.1682e-05	Th-228	1.0636e-05
Co-60	2.1157e-01	Np-239	1.4595e-09	Th-229	2.8299e-11
Cr-51	5.3064e-03	Os-191	8.5227e-05	Th-230	2.5723e-06
Cs-134	1.2314e-02	Os-194	1.7343e-07	Th-232	1.1054e-05
Cs-137	1.4291e+00	P-32	8.9883e-04	Th-234	5.3634e-04
Cs-138	1.5240e-04	P-33	1.6086e-06	U-232	1.6612e-07
Dy-166	1.8823e-04	Pa-231	2.3208e-07	U-233	1.1748e-05
Eu-152	1.1567e-01	Pa-233	1.1664e-05	U-234	1.0465e-03
Eu-154	3.8136e-03	Pb-210	8.4369e-06	U-235	4.7350e-05
Eu-155	7.9219e-04	Po-210	2.5544e-06	U-236	9.0193e-08
Eu-156	8.6691e-07	Pu-238	1.0146e-05	U-238	5.1226e-04
Fe-55	3.8027e+00	Pu-239	1.0996e-05	U-239	1.0484e-07
Fe-59	5.8020e-05	Pu-240	6.6101e-05	W-188	5.1753e-03
Gd-153	3.0687e-06	Pu-241	6.3222e-09	Y-88	2.2947e-10
H-3	2.3957e+01	Pu-242	1.6801e-08	Y-90	1.2268e-03
Hf-181	6.6637e-05	Ra-223	3.4592e-06	Zn-65	1.3656e-01
Hg-203	2.0367e-07	Ra-226	1.4854e-04	Zr-95	1.1826e-06

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Paducah Gaseous Diffusion Plant (PGDP)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PGDP, the PTCSD data includes two PGDP LLW streams planned for disposal, both at "to be determined" facilities.

Table 1-PGDP. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00438	BAE	LLW	LLW Rubble/Debris	TBD	1,430.00
01972	BBZ	LLW	LLW Solids (from VORTEC)	TBD	2,949.00

Radiological Profile

The isotope profile applied to the two PTCSD streams is the same as that developed for PGDP environmental restoration MLLW (see Appendix D-2).

Portsmouth Gaseous Diffusion Plant (PORT)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PORT, the PTCSD data includes 2 PORT LLW streams planned for disposal at Hanford.

Table 1-PORT. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00470	AAC	LLW	LLW Solids	HANF	2,031.00

Radiological Profile

The isotope profile applied to the two PTCSD streams is the same as that developed for PORT environmental restoration MLLW (see Appendix D-2).

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Oak Ridge Reservation (ORR)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-ORR, the PTCSD data includes seven ORR MLLW streams planned for disposal..

Table 1-ORR. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disp (M3)
01628	CAN	MLLW	Balance of Inventory (PORTS Soil) [TR]	COMM	2,453.00
01631	CAQ	MLLW	CNF Sludge to Direct Disposal	TBD	17,611.73
01633	CAU	MLLW	TSCAI Residuals to Direct Disposal	TBD	23,947.68
01637	CAZ	MLLW	TVS Glass Form to Direct Disposal	TBD	3.00
01640	CBC	MLLW	Repackaged WETF Sludge (Pre Head End Mods) to Direct Disposal	TBD	4,066.09
01664	CBY	MLLW	BOI LDR Treatment Residues	TBD	10,631.80
01667	CCB	MLLW	Process Residues LDR Treatment Residuals	TBD	26,379.97

Radiological Profile

A site-wide isotope profile for application to the seven PTCSD streams was derived based on data reported by ORR to the WMTDR. ORR reported four MLLW streams in this data. The planned disposition for two of these streams (Wastewaters and TSCA Feed) was reported as treatment. The planned disposition for one of the streams (Process Residues) was reported as disposal (this stream includes the wastewater treatment residuals and TSCA Ash/Sludge). The planned disposition for the remaining stream (Balance of Inventory) was reported as treatment (i.e., broad spectrum). Per the ORR PTCSD data, the residuals from this treatment are encompassed within the seven PTCSD streams planned for disposal.

Based on the above, the isotope profile (see Table 3-ORR) was derived based on a composite of the Process Residues and Balance of Inventory streams (see Table 2-ORR). The composite concentration for each isotope was calculated via Equation 2.

Table 2-ORR. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
ORR0003				MLLW Process Residues Project Rollup
ORR0004				MLLW Balance of Inventory Project Rollup

Table 3-ORR. MLLW Site-Wide Isotope Profile

Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)
Ac-228 (γ)	1.8946e-08	Cs-137	9.0710e-06	Pb-214	2.2735e-08	Th-232	3.6989e-06
Activity total	1.2313e-03	Cs-137 (γ)	9.3466e-09	Pu-238	3.0389e-07	Th-234	9.7985e-03
Am-241	5.1785e-08	Gross Alpha	1.4421e-02	Pu-239	3.2686e-05	Th-234 (γ)	1.0038e-04
Am-241 (γ)	6.8584e-07	Gross Beta	2.3210e-02	Pu-239/Pu-240	2.7341e-07	Ti-208 (γ)	3.0313e-08
Bi-212 (γ)	1.3894e-08	Gross Gamma	1.5483e-04	Ra-226	3.6629e-08	U	5.0325e+01
Co-57	9.0533e-08	H-3	2.5455e-04	Ra-226 (γ)	2.2482e-08	U-234	8.2193e-03
Co-60	1.6970e-07	K-40 (γ)	3.2839e-08	Sr-90	8.5133e-07	U-235	3.2213e-01
Co-60 (γ)	5.0522e-09	Np-237	9.9805e-04	Sr-total	5.4967e-07	U-238	6.2750e-04
Cs-134 (γ)	8.0835e-10	Pa-231 (γ)	1.1746e-07	Tc-99	6.2591e-03	U-total	4.7190e+03
Cs-135m (γ)	1.1115e-08	Pa-234 (γ)	2.1080e-06	Th-228	8.8221e-04	U-total alpha	6.0237e-04
Cs-136 (γ)	6.8205e-09	Pa-234m (γ)	1.0422e-04	Th-230	2.2502e-04		

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Paducah Gaseous Diffusion Plant (PGDP)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PGDP, the PTCSD data includes five PGDP MLLW streams planned for disposal.

Table 1-PGDP. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00449	BAP	MLLW	Treated Solids	TBD	2.97
00462	BBP	ER	Treated Solids (from VORTEC)	TBD	944.01
01974	BCB	MLLW	Treated MLLW Solids (from Broad Spec)	TBD	776.00
01976	BCD	MLLW	Treated Rad-PCB Solids (from Broad Spec)	TBD	950.00
01975	BCC	MLLW	Treated MLLW Solids (from Broad Spec)	COMM	87.00

Radiological Profile

The isotope profile applied to the five PTCSD streams is the same as that developed for PGDP environmental restoration MLLW (see Appendix D-2).

Portsmouth Gaseous Diffusion Plant (PORT)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-PORT, the PTCSD data includes three PORT MLLW streams planned for disposal.

Table 1-PORT. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00471	AAD	MLLW	TSCA Solids	TBD	2,837.00
01981	AAZ	MLLW	Incinerable Solids (to Comm)	COMM	1,526.00
01982	ABA	MLLW	Incinerable Solids (to Comm)	COMM	1,526.00

Radiological Profile

The isotope profile applied to the three PTCSD streams is the same as that developed for PORT environmental restoration MLLW (see Appendix D-2).

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Ohio Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

West Valley Demonstration Plant (WVDP)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-WVDP, the PTCSD data includes two WVDP LLW streams planned for disposal, both at "to be determined" facilities.

Table 1-WVDP. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01465	WVDP-LLW-11	LLW	Treated LLW	TBD	11,296.50
01466	WVDP-LLW-12	LLW	Treated LLW	TBD	TBD

Depending on the alternative chosen from the WVDP site closure EIS, stream 01466 may result in an additional 20,738 to 270,738 M3 requiring disposal.

Radiological Profile

WVDP reported LLW streams to the WMTDR. However, isotope concentration data was not reported for the streams. Because of this, a DOE-wide, surrogate isotope profile for LLW was applied to the two PTCSD streams. This DOE-wide profile is shown in Table 3-WVDP.

Table 3-WVDP. DOE Complex-Wide LLW Isotope Profile

Isotope	Concentration (Ci/m3)	Isotope	Concentration (Ci/m3)	Isotope	Concentration (Ci/m3)
Al-26	3.2444e-10	K-40	1.2944e-05	Sc-79	5.3119e-08
Am-241	8.4654e-04	Nb-93m	1.9253e-04	Sm-151	4.3026e-04
Am-243	3.2034e-07	Nb-94	8.6297e-06	Sn-121m	5.7738e-05
Ba-133	4.8407e-04	Ni-59	2.7883e-02	Sn-126	3.6344e-09
C-14	2.4177e-03	Ni-63	1.2565e+00	Sr-90	3.5712e+01
C-14 am	1.3683e-11	Ni-63 am	0.0000e+00	Tc-99	2.4871e-04
Cd-113m	3.5555e-05	Np-237	1.0202e-06	Th-229	6.9976e-09
Cl-36	1.6791e-06	Pa-231	5.9372e-06	Th-230	3.6903e-04
Cm-243	1.0242e-06	Pu Weap	0.0000e+00	Th-232	5.3182e-05
Cm-244	1.1429e-05	Pu-238	1.2899e-04	U nat	0.0000e+00
Co-60	5.6401e+00	Pu-239	7.3813e-04	U-232	7.7612e-07
Cs-135	6.9368e-08	Pu-240	1.7219e-04	U-233	1.0402e-05
Cs-137	3.0932e+01	Pu-241	7.7262e-04	U-234	8.3406e-04
Eu-152	5.7500e-03	Pu-242	5.0157e-08	U-235	4.2408e-05
Eu-154	5.9210e-03	Pu-244	1.4047e-10	U-236	2.5296e-06
H-3	2.8501e+00	Ra-226	1.2488e-03	U-238	1.9409e-03
I-129	2.5275e-06	Ra-228	8.0594e-07	Zr-93	7.3842e-06

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Mound Plant (MND)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-MND, the PTCSD data includes three MND MLLW streams planned for disposal. One is targeted to an off-site, commercial facility while two are targeted for "to be determined" off-site facilities.

Table 1-MND. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01322	MLLW-10	MLLW	Treated MLLW (Inorganics)	TBD	0.00
01324	MLLW-12	MLLW	Treated MLLW (Tritium)	TBD	0.00
01323	MLLW-11	MLLW	Treated MLLW (Organics)	COMM	0.00

Radiological Profile

The isotope profile for application to the three PTCSD streams was derived based on data reported by MND to the WMTDR. Mound reported 16 MLLW streams in this data. Isotopes, but no concentrations, were reported for all 16 streams (the 95MWIR did not include concentration data either). The isotope profile, shown in Table 3-MND, is a composite of the unique isotopes reported across the 16 streams (see Table 2-MND).

Table 2-MND. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
MD0001	MD-W001			Scintillation Cocktail
MD0002	MD-W004	MD-W004A		Lead - LLW
MD0003	MD-W005			Contaminated Mercury
MD0004	MD-W007	MD-W007A		Lead Waste Drained Batteries
MD0005	MD-W008			Kerosene, PCB, Tritium Contaminated
MD0007	MD-W010			Lab Packs With Metals
MD0008	MD-W011			Lab Packs Without Metals
MD0009	MD-W012			Lead Loaded Gloves --LLW
MD0010	MD-W013			Waste Oils
MD0011	MD-W014			Newly Discovered Potentially Mixed Waste
MD0012	MD-W019			Tritiated Oils
MD0013	MD-W020			Tritiated Absorbed Oils
MD0014	MD-W021			Oil Contaminated Florco
MD0015	MD-W023			Scint. Cocktail Contam. Florco
MD0016	MD-W024			Scint. Cocktail Contam. Trash
MD0025				Rad PCB contaminated debris

Table 3-MND. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241		Pu-238	
Am-241 Gamma		Pu-238/Pu-241	
Co-60 Gamma		Pu-239/Pu-240	
Cs-137 Gamma		Th-natural	
H-3			

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Richland Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Hanford Site (HANF)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-HANF, the PTCSD data includes seven Hanford-generated LLW streams planned for disposal; all on-site.

Table 1-HANF. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Sourc Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01510	NPD	MLLW	Stored Feed Pending LLW Disp	HANF	345.00
01557	LN11G	LLW	LLW Cat 1 Direct Disp	HANF	81,341.94
01558	LN13P	LLW	LLW Verif/Cert to Disp	HANF	620.87
01559	LN12P	LLW	LLW Treated Liquid to Disp	HANF	360.00
01560	LN3P	LLW	Overpacked LLW Cat 3	HANF	141,101.81
01572	TRPL	TRU	LLW Assayed From TRU	HANF	3,837.50
01576	TMPL	TRU	M91 Product to LLW	HANF	3,316.60

Radiological Profile

A site-wide isotope profile for application to the seven PTCSD streams was derived based on data reported by Hanford to the WMTDR. Hanford reported 158 LLW streams in the WMTDR data. Of these, 114 were targeted to on-site disposal and 50 were slated for treatment. Disposition data was not reported for the remaining four. Seventy-four (74) of the 114 targeted to on-site disposal were reported as generated at Hanford with the remaining 40 reported as receipts from other sites. Ten of the 40 off-site receipt streams are from sites which were not required to report in the PTCSD data. However, waste from these sites is accounted for within the above-mentioned seven PTCSD streams. Therefore, these 10 streams, along with the 74 Hanford-generated streams, were used as the basis for developing the site-wide isotope profile. These streams are listed in Table 2-HANF (only 71 of the 84 streams are listed as isotope data was not reported for 13 of the streams). The site-wide isotope profile is shown in Table 3-HANF. The composite concentration for each isotope was calculated via Equation 1.

Table 2-HANF. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
HANF1011	HLN97F_BTL_CHLLW1_DR_S	BAPL CH Cat1 LLW Solids in Drums
HANF1012	HLN97F_BTL_CHLLW1_MB_S	BAPL CH Cat1 LLW Solids in Med Boxes
HANF1014	HLN97F_BTS_CHLLW1_MB_S	BAPL CH Cat1 LLW Solids in Med Boxes
HANF1017	HLN97F_D1A_CHLLW1_DR_S	Hanford Reactor Areas CH Cat1 LLW Solids in Drums
HANF1018	HLN97F_D1A_CHLLW1_MB_S	Hanford Reactor Areas CH Cat1 LLW Solids in Med Boxes
HANF1021	HLN97F_D2A_CHLLW1_DR_S	Hanford Chem Separations Area CH Cat1 LLW Solids in Drums
HANF1022	HLN97F_D2A_CHLLW1_MB_S	Hanford Chem Separations Area CH Cat1 LLW Solids in Med Boxes
HANF1027	HLN97F_D2S_CHLLW1_DR_S	Hanford Solid Waste Fac CH Cat1 LLW Solids in Drums
HANF1028	HLN97F_D2S_CHLLW1_MB_S	Hanford Solid Waste Fac CH Cat1 LLW Solids in Med Boxes
HANF1030	HLN97F_D2S_RHLLW1_DR_S	Hanford Solid Waste Fac RH Cat1 LLW Solids in Drums
HANF1031	HLN97F_D2S_RHLLW1_MB_S	Hanford Solid Waste Fac RH Cat1 LLW Solids in Med Boxes
HANF1038	HLN97F_DRD_CHLLW1_DR_S	Hanford Site R&D CH Cat1 LLW Solids in Drums
HANF1039	HLN97F_DRD_CHLLW1_MB_S	Hanford Site R&D CH Cat1 LLW Solids in Med Boxes
HANF1043	HLN97F_DTD_CHLLW1_DR_S	Hanford Tank Disposal CH Cat1 LLW Solids in Drums
HANF1044	HLN97F_DTD_CHLLW1_MB_S	Hanford Tank Disposal CH Cat1 LLW Solids in Med Boxes
HANF1047	HLN97F_DWR_CHLLW1_DR_S	Hanford Well Drilling CH Cat1 LLW Solids in Drums
HANF1048	HLN97F_DWR_CHLLW1_MB_S	Hanford Well Drilling CH Cat1 LLW Solids in Med Boxes
HANF1054	HLN97F_KAS_CHLLW1_MB_S	Knolls CH Cat1 LLW Solids in Med Boxes

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-HANF. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
HANF1060	HLN97F_MIT_CHLLW1_DR_S	MIT CH Cat1 LLW Solids in Drums
HANF1061	HLN97F_N3A_CHLLW1_DR_S	Hanford FFTF CH Cat1 LLW Solids in Drums
HANF1062	HLN97F_N3A_CHLLW1_MB_S	Hanford FFTF CH Cat1 LLW Solids in Med Boxes
HANF1071	HLN97F_PNL_CHLLW1_DR_S	Pac NW Nat Labs CH Cat1 LLW Solids in Drums
HANF1072	HLN97F_PNL_CHLLW1_MB_S	Pac NW Nat Labs CH Cat1 LLW Solids in Med Boxes
HANF1075	HLN97F_PNL_RHLLW1_DR_S	Pac NW Nat Labs RH Cat1 LLW Solids in Drums
HANF1076	HLN97F_PNL_RHLLW1_MB_S	Pac NW Nat Labs RH Cat1 LLW Solids in Med Boxes
HANF1086	HLN97F_UUT_CHLLW1_DR_S	Univ of Utah CH Cat1 LLW Solids in Drums
HANF1087	HLN97F_WW2_CHLLW1_DR_S	Sep Area WW Treatment CH Cat1 LLW Solids in Drums
HANF1089	HLN97F_WW3_CHLLW1_MB_S	Fuel Fab/RD Area WW Treatment CH Cat1 LLW Solids in Med Boxes
HANF1090	HLN97F_ANL_CHLLW3_DR_T	ANLE CH Cat3 LLW Overpacked Solids in Drums
HANF1091	HLN97F_ANL_CHLLW3_MB_T	ANLE CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1092	HLN97F_ANL_RHLLW3_DR_T	ANLE RH Cat3 LLW Overpacked Solids in Drums
HANF1093	HLN97F_BCL_CHLLW3_MB_T	BCL CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1094	HLN97F_BTL_CHLLW3_MB_T	BAPL CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1095	HLN97F_D1A_CHLLW3_DR_T	Hanford Reactor Areas CH Cat3 LLW Overpacked Solids in Drums
HANF1096	HLN97F_D1A_CHLLW3_MB_T	Hanford Reactor Areas CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1097	HLN97F_D2A_CHLLW3_DR_T	Hanford Chem Separations Area CH Cat3 LLW Overpacked Solids in Drums
HANF1098	HLN97F_D2A_CHLLW3_MB_T	Hanford Chem Separations Area CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1106	HLN97F_DRD_CHLLW3_DR_T	Hanford Site R&D CH Cat3 LLW Overpacked Solids in Drums
HANF1107	HLN97F_DRD_CHLLW3_MB_T	Hanford Site R&D CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1108	HLN97F_DRD_RHLLW3_DR_T	Hanford Site R&D RH Cat3 LLW Overpacked Solids in Drums
HANF1109	HLN97F_DTD_CHLLW3_MB_T	Hanford Tank Disposal CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1110	HLN97F_DTD_RHLLW3_MB_T	Hanford Tank Disposal RH Cat3 LLW Overpacked Solids in Med Boxes
HANF1111	HLN97F_GEN_CHLLW3_MB_T	GA CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1112	HLN97F_GEN_RHLLW3_DR_T	GA RH Cat3 LLW Overpacked Solids in Drums
HANF1113	HLN97F_KAS_CHLLW3_LB_T	Knolls CH Cat3 LLW Overpacked Solids in Lrg Boxes
HANF1114	HLN97F_KAS_CHLLW3_XB_T	Knolls CH Cat3 LLW Overpacked Solids in Extr Lrg Boxes
HANF1115	HLN97F_N3A_CHLLW3_DR_T	Hanford FFTF CH Cat3 LLW Overpacked Solids in Drums
HANF1116	HLN97F_N3A_RHLLW3_DR_T	Hanford FFTF RH Cat3 LLW Overpacked Solids in Drums
HANF1117	HLN97F_PAD_CHLLW3_DR_T	PGDP CH Cat3 LLW Overpacked Solids in Drums
HANF1118	HLN97F_PES_CHLLW3_DR_T	Portsmouth Naval Shipyards CH Cat3 LLW Overpacked Solids in Drums
HANF1119	HLN97F_PES_CHLLW3_MB_T	Portsmouth Naval Shipyards CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1120	HLN97F_PNL_CHLLW3_DR_T	Pac NW Nat Labs CH Cat3 LLW Overpacked Solids in Drums
HANF1121	HLN97F_PNL_CHLLW3_MB_T	Pac NW Nat Labs CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1122	HLN97F_PNL_RHLLW3_DR_T	Pac NW Nat Labs RH Cat3 LLW Overpacked Solids in Drums
HANF1123	HLN97F_PNL_RHLLW3_MB_T	Pac NW Nat Labs RH Cat3 LLW Overpacked Solids in Med Boxes
HANF1124	HLN97F_TTF_CHLLW3_MB_T	Stanford CH Cat3 LLW Overpacked Solids in Med Boxes
HANF1125	HLN97F_UCD_CHLLW3_MB_T	UCD CH Cat3 LLW Overpacked Solids in Med Boxes
HANF3012		FY 96 Fermi LLW Solids
HANF3017		FY 96 Stanford Univ LLW Solids
HANF3019		FY 96 Hanford ER LLW Solids
HANF3020		FY 96 Hanford Fuel Fab Basin Remed LLW Solids
HANF3021		FY 96 Hanford Fuel Stor LLW Solids

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 2-HANF. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site ID	Stream Name
HANF3022		FY 96 Hanford Fuel Reproc LLW Solids
HANF3023		FY 96 Hanford Tank Farm LLW Solids
HANF3024		FY 96 Hanford Misc M&O LLW Solids
HANF3025		FY 96 Hanford Uranium Product LLW Solids
HANF3026		FY 96 Hanford Plutonium Product LLW Solids
HANF3027		FY 96 Solid Waste Fac LLW Solids
HANF3028		FY 96 Hanford Fuel Fab Facilities LLW Solids
HANF3029		FY 96 Pac NW Nat Lab R&D LLW Solids
HANF3030		FY 96 Hanford Fuel Fab WW LLW Solids

Table 3-HANF. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)
Am-241	1.9705e-03
Am-243	1.1391e-07
Ba-137m	7.2417e+01
C-14	7.3519e-04
Cl-36	3.3908e-11
Cm-243	1.2247e-08
Cm-244	1.8104e-05
Co-60	6.9133e-01
Cs-137	7.6551e+01
H-3	5.9372e-02
I-129	5.9594e-06
Ni-59	1.8682e-05
Ni-63	2.2200e-09
Np-237	5.7680e-07
Pu-238	3.2457e-06
Pu-239	1.3661e-03
Pu-240	3.9212e-04
Pu-241	1.4805e-03
Pu-242	1.5435e-09
Ra-226	1.0115e-10
Se-79	7.2185e-09
Sr-90	8.8436e+01
Tc-99	5.8338e-04
Th-232	1.0369e-10
U-233	2.3709e-05
U-234	1.0116e-04
U-235	3.6087e-06
U-236	5.1918e-06
U-238	1.9308e-04
Y-90	8.8436e+01

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-HANF, the PTCSD data includes 16 Hanford MLLW streams planned for disposal with 10 targeted to on-site and 6 targeted to off-site "to be determined" facilities.

Table 1-HANF. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01525	SPA1	MLLW	Comm Stabl Prod to NR	TBD	21.17
01526	SPA2	MLLW	Comm Stabl Prod to Bat Col	TBD	13.00
01528	SPB1	MLLW	Stabl Prod to Bat Col	TBD	4.80
01532	TPB1	MLLW	Thermal Trtmnt Prod to NR	TBD	0.80
01534	MPA1	MLLW	Comm Macro Prod to NR	TBD	40.37
01538	TPP21	MLLW	Lead Macro Cont to NR	TBD	21.36
01511	NPC	MLLW	Stored Feed Pending Disp Fac Avail	HANF	31,633.94
01527	SPA3	MLLW	Comm Stabl Prod to Disp	HANF	365.83
01529	SPB2	MLLW	Stabl Prod to Disp	HANF	18,198.85
01530	WSP	MLLW	WRAP Stabl Prod to Disp	HANF	394.74
01533	TPB2	MLLW	Thermal Trtmnt Prod to Disp	HANF	2,298.57
01535	MPA2	MLLW	Comm Macro Prod to Disp	HANF	2,966.55
01536	MPB	MLLW	Debris Trtmnt Prod to Disp	HANF	40,639.67
01539	TPP22	MLLW	Lead Macro Cont to Disp	HANF	708.90
01540	WAP	MLLW	WRAP Amlgm Prod to Disp	HANF	29.31
01541	M91PC	MLLW	M91 Prod to Disp	HANF	1,737.89

Radiological Profile

A site-wide isotope profile for application to the 16 PTCSD streams was derived based on data reported by Hanford to the WMTDR. Hanford reported 32 MLLW streams in this data. Twelve of these streams, shown in Table 2-HANF, correlate directly to the 16 PTCSD streams. Isotopes and concentrations were reported for these 12 streams. The site-wide MLLW isotope profile, shown in Table 3-HANF, is based on a composite of these streams. The composite concentration for each isotope was calculated via Equation 2.

Table 2-HANF. Isotope Profile Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name
HANF2002			HAN-MLLW-02	ETF solids
HANF2003			HAN-MLLW-03	SST long-length equip
HANF2004			HAN-MLLW-04	Basin solidified liquids
HANF2005			HAN-MLLW-05	Basin solids
HANF2006			HAN-MLLW-06	Homogeneous solids and soils w/ met. no Hg or org
HANF2007			HAN-MLLW-07	Debris (no PCB's)
HANF2008			HAN-MLLW-08	Organic labpacks
HANF2009			HAN-MLLW-09	Homogeneous solids, soils w/ org and metals, and PCB debris
HANF2010			HAN-MLLW-10	Inorganic lab packs
HANF2011			HAN-MLLW-11	Elemental mercury
HANF2012			HAN-MLLW-12	Generalized RH
HANF2013			HAN-MLLW-13	Elemental Lead

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3-HANF. Isotope Profile - Category 1 MLLW Streams

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	3.4481e-05	Fe-59	1.2967e-06	Pu-238	5.6665e-06	Th-232	3.1946e-07
Am-243	1.2149e-07	H-3	1.2585e-03	Pu-239	8.5089e-05	U-233	9.9158e-08
Ba-137m	4.5571e-02	I-129	1.5735e-06	Pu-240	1.4690e-05	U-234	6.1282e-03
C-14	8.2622e-05	Kr-85	0.0000e+00	Pu-241	1.9174e-03	U-235	6.2482e-04
Cm-243	9.9358e-10	Mn-54	3.6093e-04	Pu-242	1.6279e-09	U-236	1.9487e-08
Cm-244	8.9927e-09	Ni-59	1.1068e-02	Sr-90	8.2834e-02	U-238	1.1403e-05
Co-60	6.9704e-01	Ni-63	1.2864e+00	Tc-99	6.7122e-04	Y-90	8.1434e-02
Cs-137	4.8144e-02	Np-237	1.4696e-06				
Fe-55	1.2553e-01						

Appendix D-1

Rocky Flats Office

Rocky Flats Environmental Technology Site (RFETS)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-RFETS, the PTCSD data includes three RFETS LLW streams planned for disposal; all at the Nevada Test Site (NTS).

Table 1-RFETS. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
01392	L-01	LLW	Routine Ops./ Deactivation Solids Process Waste	NTS	19,079.00
01394	L-02A	LLW	Classified Waste	NTS	40.00
02289	NM-01	LLW	LLW from RFETS-NM-1 to 9	NTS	1,096.20

Radiological Profile

A site-wide isotope profile for application to the three PTCSD LLW streams was derived based on data reported by RFETS to the WMTDR. RFETS reported 15 LLW streams in this data. Isotopes and concentrations were reported for all the streams. Fourteen of the streams were destined for disposal; 12 at NTS and 2 at an off-site, commercial facility. The remaining stream was targeted for treatment at the TSCA Incinerator. The site-wide profile (see Table 3-RFETS) was derived based on a composite of that reported for the 14 streams destined for disposal (see Table 2-RFETS). The composite concentration for each isotope was calculated via Equation 1.

Table 2-RFETS. Isotope Profile Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name
RFTS0047	IDCs 325, 326	Mixed IDCs Combustible/LLW
RFTS0049	IDCs 300, 301, 334, 438	Compactible Debris/LLW
RFTS0050	IDCs 331, 335, 338, 342,	Composite Filter Debris/LLW
RFTS0051	IDC 864	Medical/Infectious Waste/LLW
RFTS0054	IDC 374	Soil/Gravel/LLW
RFTS0056	IDC 201	Sealed Sources/LLW
RFTS0057	IDC 404	Salt Waste/LLW
RFTS0058	IDCs 419, 425	Ash/LLW
RFTS0059	IDCs 360...871	Inorganic Homogeneous Solids/LLW
RFTS0060	IDCs 000...886	Unknown/Other/LLW
RFTS0063	IDCs 505...1949	Aqueous Slurries/LLW
RFTS0064	IDCs 295...807	Solidified Homogeneous Solids/LLW
RFTS0065	IDCs 320...888	Metal Debris/LLW
RFTS0066	IDCs 302...863	Combustibles/LLW

Table 3-RFETS. Isotope Profile - Category 1 LLW Streams

Isotope	Concentration (Ci/M3)
Pu-238	5.9842e-12
Pu-239	4.0361e-03
Pu-240	4.7873e-11

Category 1 MLLW Streams: Generated by Sources other than ER and Disposed by WM

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-RFETS, the PTCSD data include three RFETS MLLW streams planned for disposal. One is targeted to an off-site, commercial facility and two are targeted to off-site "to be determined" facilities.

Table 1-RFETS. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disp (M3)
PT002	M-01A-WM	MLLW	Sorted Routine Ops/Deact Solids to Disposal (WM Portion)	TBD	2,266.90
PT006	M-01BA-WM	MLLW	Treated Routine Ops/Deact Solids to Disposal (WM Portion)	TBD	5,094.90
P1408	M-08	MLLW	Saltcrete/Pondcrete [D-ROD]	COMM	10,940.00

Radiological Profile

The three PTC streams correlate well with streams reported by RFETS in the WMTDR. RFETS reported 39 MLLW streams in the WMTDR. One of the PTCSD streams (M-08) correlates directly to two WMTDR streams (Pondcrete and Saltcrete). The other two PTCSD streams (M-01A and M-01BA) correlate to the other WMTDR streams except PCB Liquids, PCB Solids, and Combustible Solids. Therefore, two isotopes profiles, one for application to PTCSD stream M-08 and another for application to PTCSD streams M-01A and M-01B, were derived.

As shown in Table 2-RFETS, both profiles are composites of multiple WMTDR streams with the concentrations for the isotopes calculated using Equation 2. The resultant isotope profiles are shown in Tables 3a-RFETS and 3b-RFETS.

Table 2-RFETS. Isotope Profiles Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name	Isotope Profile
RFTS0008	RF-W018		IDC 805	Pondcrete/LLM	M-08
RFTS0009	RF-W019		IDC 804	Saltcrete/LLM	M-08
RFTS0001	RF-W005	RF-W005A	IDC 480	Metal/LLM	M-01A/M-01BA
RFTS0003	RF-W007		IDC 069, 869	Roaster Oxide/LLM	M-01A/M-01BA
RFTS0004	RF-W009		IDCs 001, 007, 807	Solidified Bypass Sludge/LLM	M-01A/M-01BA
RFTS0005	RF-W015		IDCs 529, 530	FBI Oil/LLM	M-01A/M-01BA
RFTS0006	RF-W016		IDCs 400, 503, 508, 890	Acid/LLM	M-01A/M-01BA
RFTS0011	RF-W022		IDCs 420, 425	Incinerator Ash/LLM	M-01A/M-01BA
RFTS0012	RF-W023		IDC 321	Lead/LLM	M-01A/M-01BA
RFTS0013	RF-W024	RF-W024A	IDCs 442, 444, 855	Ground Glass/LLM	M-01A/M-01BA
RFTS0014	RF-W025	RF-W025A	IDC 375	Used Absorbents/LLM	M-01A/M-01BA
RFTS0015	RF-W027		IDCs 523, 532	Paints/LLM	M-01A/M-01BA
RFTS0016	RF-W030		IDC 339	Leaded Gloves/LLM	M-01A/M-01BA
RFTS0017	RF-W031		IDC 341	Leaded Gloves-Acid Contaminated/LLM	M-01A/M-01BA
RFTS0018	RF-W035		IDC 488	Glovebox Parts w/Lead/LLM	M-01A/M-01BA
RFTS0019	RF-W042	RF-W042A	IDC 320	Heavy Metal (non-SS)/LLM	M-01A/M-01BA
RFTS0020	RF-W043	RF-W043A	IDC 440	Glass/LLM	M-01A/M-01BA
RFTS0021	RF-W045	RF-W045A	IDC 438	Insulation/LLM	M-01A/M-01BA
RFTS0022	RF-W046		IDCs 533 and 535	Organics Discard Level/LLM	M-01A/M-01BA
RFTS0023	RF-W047	RF-W047A	IDC 541	Analytical Lab Solutions/LLM	M-01A/M-01BA
RFTS0024	RF-W049		IDCs 505, 527, 599	Miscellaneous Liquids/LLM	M-01A/M-01BA
RFTS0025	RF-W050	RF-W050A	IDCs 374, 1373	Soil and Cleanup Debris/LLM	M-01A/M-01BA
RFTS0028	RF-W062		IDC 801	Solidified Organics/LLM	M-01A/M-01BA

Category 1 MLLW Streams: Generated by Sources other than ER and Disposed by WM

Table 2-RFETS. Isotope Profiles Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name	Isotope Profile
RFTS0029	RF-W071	RF-W071A	IDCs 292, 299, 332, 371.	Particulate Sludge/LLM	M-01A/M-01BA
RFTS0030	RF-W074	RF-W074A	IDC 338	Cemented Filters/LLM	M-01A/M-01BA
RFTS0031	RF-W075	RF-W075A	IDCs 331, 335, 490, 814	Filters/LLM	M-01A/M-01BA
RFTS0032	RF-W078		None	Wastewater / LLM	M-01A/M-01BA
RFTS0033	RF-W079		None	Wet Slurry / LLM	M-01A/M-01BA
RFTS0034	RF-W080		NA	Nitrate Salts/LLM	M-01A/M-01BA
RFTS0036	RF-W083		None	Excess Chemicals Organometallic Lab Packs/LLM	M-01A/M-01BA
RFTS0037	RF-W085		None	Excess Chemicals Non-Lab Packs W/Hg	M-01A/M-01BA
RFTS0038	RF-W086		IDCs 544, 545, 880, 881.	Excess Chemicals Non-Lab Packs - Other	M-01A/M-01BA
RFTS0040	RF-W088		NA	Solar Pond Sludge/LLM	M-01A/M-01BA
RFTS0044	RF-W003		IDC 327	Cemented Composite Chips/LLM	M-01A/M-01BA
RFTS0045			IDCs 430, 431	Resin/LLM	M-01A/M-01BA

Table 3a-RFETS. Isotope Profile - PTCSD Stream M-08

Isotope	Concentration (Ci/M3)
Am-241	2.0468e-03
K-40	2.2245e-05
Pu-238	1.0005e-06
Pu-239/Pu-240	6.3630e-04
Ra-226	7.0486e-07
U-233	6.6504e-05
U-234	6.5219e-05
U-235	1.3531e-05
U-238	1.6382e-04

Table 3b-RFETS. Isotope Profile - PTCSD Streams M-01A and M-01BA

Isotope	Concentration (Ci/M3)
Cs-137	4.0839e-10
Pu-238	1.9640e-08
Pu-239	4.8354e-03
Pu-239/Pu-240	4.3164e-04
Pu-240	5.6444e-09
Th-228	5.1049e-10
Th-230	2.2121e-09
Th-232	6.8066e-11
U-233	2.3631e-04
U-235	3.0040e-05
U-237	1.2197e-07
U-238	1.8504e-04

Appendix D-1

Savannah River Operations Office

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Savannah River Site (SRS)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-SRS, the PTCSD data includes 15 SRS LLW streams planned for disposal. Fourteen are targeted for on-site disposal in the Intermediate Level Vaults (ILV), Low Activity Waste Vaults (LAWV), and Slit Trench. The remaining LLW stream is targeted to off-site, commercial disposal.

Table 1-SRS. Category 1 PTCSD LLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Disposal Facility	Life Cycle Disposed (M3)
00518	LAM	LLW	Compacted Low Activity from Vendor	SRS	LAWV	109.70
00521	LAN	LLW	WSF Compacted LLW	SRS	LAWV	10,448.30
00523	LAP	LLW	WSF Sort/Seg for E Area LAWV	SRS	LAWV	6,784.00
00525	LAR	LLW	WSF Sort/Seg for E Area Trench	SRS	Slit	13,568.10
00527	LAD	LLW	Direct dispose Bulk Metal to E Area Trench	SRS	Slit	37,976.50
00529	LAT	LLW	CIF Secondary Waste to E Area Trench	SRS	Slit	4,780.10
00534	LAH	LLW	Contaminated Soil/Debris to E Area Trench	SRS	Slit	27,667.40
00536	LAV	LLW	Size Red CLE to E Area Trench	SRS	Slit	990.00
00539	LAK	LLW	Intermediate Level Waste	SRS	ILV	2,937.10
00541	MAC	MLLW	MLLW (Characteristic) to E Area Trench	SRS	Slit	396.00
01912	MAC	MLLW	CIF Stabilized Ash with Char. Constituents	SRS	Slit	395.98
01915	MAV	MLLW	Stabilized Ion Exchange Waste	SRS	Slit	0.02
01918	MAY	MLLW	Treated Soils/Sludges with Char. Constituents	SRS	Slit	22.40
01921	MBB	MLLW	Treated Tritiated Oil with Hg	SRS	Slit	24.70
00537	LAW	LLW	Size Red CLE to Offsite Disposal	COMM	Comm	990.00

Radiological Profile

Three SRS LLW radiological profiles were derived, one each for application to the PTCSD streams targeted to the ILV, LAWV, and Slit Trench. Derivation of these profiles was based on data reported by SRS to the WMTDR. SRS reported four LLW streams in this data. As shown in Table 2-SRS, two streams were destined for disposal at the ILV, one each for tritiated and non-tritiated LLW. One stream was destined for disposal at the LAWV and one was destined for disposal at the Slit Trench.

Isotopes were reported for each of the four LLW streams along with the projected amount (Ci) and volumes (M3) to be disposed during 1997. Given this data, the isotope concentrations in the three facility-specific profiles were determined by dividing the projected curies to be disposed in 1997 by the estimated LLW volume to be disposed. For the ILV profile, a composite of the tritiated and non-tritiated streams was used. The isotope profiles are shown in Tables 3a-SRS, 3b-SRS and 3c-SRS.

Table 2-SRS. Isotope Profiles Basis - Category 1 LLW Streams

WMTDR Id	Site Id	Stream Name	Profile
SRS0057	E-Area Vaults, LAWV	Waste Designated as Low Activity Waste	LAWV
SRS0061	E-Area Vaults, ILNTV	Waste Designated as Intermediate Level Non-Tritium	ILV
SRS0062	E-Area Vaults, ILTV	Waste Designated as Intermediate Level Tritium	ILV
SRS0063	E-Area Vaults, Slit Trench	Waste Designated as Soil or Rubble for Slit Trench Disposal	Slit

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3a-SRS. Isotope Profile - Intermediate Level Vaults

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.0353e-03	I-129	2.4260e-08	Pu-238	1.0999e-03	Tc-99	2.4152e-05
Ba-137m	1.9606e-03	Mn-54	2.4211e-03	Pu-239	2.1925e-05	Th-231	8.1924e-07
Bi-214	3.9093e-03	Ni-59	1.3576e-04	Pu-240	8.7760e-06	Th-232	1.0569e-07
C-14	4.4022e-04	Ni-63	1.3127e-02	Pu-241	5.4145e-04	Th-234	6.7920e-04
Cm-244	0.0000e+00	Np-237	4.0974e-08	Pu-242	1.1699e-08	U-233	5.0607e-04
Co-58	1.2693e-02	Pa-234	6.7130e-04	Ra-226	3.9093e-03	U-234	5.4032e-04
Co-60	2.1686e-01	Pa-234m	7.9060e-06	Rn-222	3.9093e-03	U-235	2.8621e-05
Cs-137	2.1043e-01	Pb-210	3.9093e-03	Se-79	1.3182e-07	U-236	7.8361e-06
Eu-154	0.0000e+00	Pb-214	3.9093e-03	Sn-126	1.4042e-08	U-238	2.7011e-03
Fe-55	7.2956e-02	Po-214	3.9093e-03	Sr-90	9.2417e-04	Y-90	1.2790e-08
H-3	5.0333e+02	Po-218	3.9093e-03				

Table 3b-SRS. Isotope Profile - Low Activity Waste Vaults

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Ac-228	4.6633e-08	Cs-135	7.5746e-14	Po-212	2.6636e-08	Sm-151	7.5072e-09
Am-241	1.8077e-04	Cs-137	2.4692e-03	Po-216	4.6463e-08	Sn-126	2.7895e-07
Am-243	9.6918e-10	Eu-152	5.9264e-05	Pr-144	3.1499e-05	Sr-85	8.0184e-08
Ba-137m	8.7552e-04	Eu-154	4.0232e-05	Pr-144m	5.1335e-08	Sr-90	1.4770e-03
Bi-212	4.6678e-08	Fe-55	1.1747e-03	Pu-238	1.1530e-03	Tc-99	5.9483e-06
C-14	2.4628e-06	H-3	2.2811e+01	Pu-239	1.6622e-03	Th-228	4.6463e-08
Cd-109	0.0000e+00	Hf-181	0.0000e+00	Pu-240	2.5111e-04	Th-230	4.6093e-08
Ce-144	1.3860e-04	Hg-203	0.0000e+00	Pu-241	3.7299e-03	Th-231	1.5711e-07
Cf-249	4.7402e-19	I-129	1.5549e-09	Pu-242	4.3675e-06	Th-232	4.6096e-08
Cf-250	2.2894e-09	Kr-85	4.2994e-05	Pu-244	4.2557e-20	Th-234	8.4793e-05
Cf-251	3.6312e-20	Mn-54	3.9836e-05	Ra-224	4.6463e-08	Tl-208	1.5013e-08
Cf-252	1.9789e-08	Nb-94	0.0000e+00	Ra-226	4.1522e-11	U-232	6.7668e-11
Cm-244	1.3336e-06	Ni-59	1.9826e-06	Ra-228	4.6457e-08	U-233	2.6267e-06
Cm-245	2.3880e-14	Ni-63	2.5294e-04	Rb-86	0.0000e+00	U-234	2.7252e-04
Cm-246	9.5654e-15	Np-237	6.1534e-05	Rh-106	6.8962e-06	U-235	5.5065e-06
Cm-247	2.8632e-20	Pa-234	1.4038e-07	Rn-220	4.6422e-08	U-236	4.3568e-05
Cm-248	9.0796e-20	Pa-234m	8.4652e-05	Ru-106	1.5263e-04	U-238	1.2056e-04
Co-57	0.0000e+00	Pb-212	4.6923e-08	S-35	4.9129e-07	Y-90	8.8509e-04
Co-58	2.5735e-04	Pd-107	1.7938e-17	Sb-125	1.0819e-04	Zn-65	0.0000e+00
Co-60	6.7797e-04	Pm-147	7.0362e-04	Se-79	5.6394e-06	Zr-93	9.9102e-11
Cs-134	5.3851e-05						

Category 1 LLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3c-SRS. Isotope Profile - Slit Trench

Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)	Isotope	Concentration (Ci/M3)
Am-241	1.2369e-06	H-3	8.4582e-04	Pu-238	5.3940e-08	Sr-90	9.7002e-06
Ba-137m	5.5817e-08	I-129	2.1013e-11	Pu-239	1.0266e-07	Tc-99	2.0578e-07
C-14	6.4932e-07	Ni-59	5.6236e-07	Pu-240	1.8494e-08	U-233	5.8523e-12
Ce-144	5.0601e-10	Ni-63	1.5299e-06	Pu-241	9.6585e-07	U-234	3.9426e-08
Cm-244	4.8519e-11	Np-237	3.0426e-10	Pu-242	4.8582e-10	U-235	2.5684e-09
Co-58	6.9858e-07	Pb-212	0.0000e+00	Rh-106	8.8160e-10	U-236	2.4804e-12
Co-60	5.0507e-06	Pm-147	2.9474e-09	Ru-106	9.7808e-10	U-238	6.4054e-08
Cs-137	3.5146e-05	Pr-144	4.9818e-10	Se-79	1.2115e-12	Y-90	4.4864e-08
Eu-154	0.0000e+00	Pr-144m	6.0514e-12	Sn-126	3.9027e-08	Zn-65	5.1125e-07
Fe-55	1.7484e-05						

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Savannah River Site (SRS)

PTCSD Streams and Projected Disposed Volumes

As shown in Table 1-SRS, the PTCSD data includes eight SRS MLLW streams planned for disposal. All are targeted to "to-be-determined" facilities.

Table 1A. Category 1 PTCSD MLLW Streams Planned for Disposal

HQ Id	Map Id	Source Map	Stream Name	Disposal Site	Life Cycle Disposed (M3)
00573	TAK	TRU	Treated Segregated drums meeting LDR [alpha]	TBD	230.00
00576	TAN	TRU	Drums segregated as MLLW [alpha]	TBD	2,706.60
01908	MAS	MLLW	Meets treatment std	TBD	643.72
01913	MAD	MLLW	CIF Stabilized Ash with Listed Constituents	TBD	89.65
01916	MAW	MLLW	Macroencapsulated Waste	TBD	1,791.99
01919	MAZ	MLLW	Treated Non-Incinerable Rad PCBs	TBD	4.00
01920	MBA	MLLW	Treated Soils/Sludges-M Area	TBD	635.70
01922	MBD	MLLW	Treated Soils/Sludges with Listed Constituents	TBD	34.02

Radiological Profile

The eight PTCSD streams correlate well with streams reported by SRS in the WMTDR. Therefore, separate profiles were derived for application to the PTCSD streams based on data reported in the WMTDR. Table 2-SRS identifies the WMTDR stream(s) used to derive each profile. For the profiles based on more than one WMTDR stream, composites were derived using Equation 2. The resultant profiles are shown in Tables 3a-SRS through 3g-SRS.

Table 2-SRS. Isotope Profiles Basis - Category 1 MLLW Streams

WMTDR Id	95MWIR Id	STP Id	Site Id	Stream Name	Isotope Profile
SRS1046	SR-W046			Consolidated Incineration Facility (CIF) Ash	MAD
SRS1024	SR-W024		2	Mercury/Tritium Gold Traps	MAS
SRS1063	SR-W063			Macroencapsulated Toxic Characteristic (TC) Waste	MAS
SRS1009	SR-W009			Silver Coated Packing Material	MAW
SRS1015	SR-W015		2	Mercury/Tritium Contaminated Equipment	MAW
SRS1023	SR-W023			Cadmium Safety/Control Rods	MAW
SRS1060	SR-W060			Tritiated Water With Mercury	MAW
SRS1062	SR-W062			Low-Level Contaminated Debris	MAW
SRS1069	SR-W069			LLW Lead - To Be Macroencapsulated	MAW
SRS0065			Rad PCB Waste	Radioactive Polychlorinated Biphenyl (PCB) Waste	MAZ
SRS1005	SR-W005			Mark 15 Filtercake	MBA
SRS1029	SR-W029			M-Area Sludge Treatability Samples	MBA
SRS1031	SR-W031			Uranium/Chromium Soln	MBA
SRS1037	SR-W037			M-Area Plating Line Sludge	MBA
SRS1038	SR-W038		SR-W038	Plating Line Sump Material	MBA
SRS1039	SR-W039		SR-W039	Nickel Plating Line Solution	MBA
SRS1048	SR-W048			Soils From Spill Remediation	MBA
SRS1064	SR-W064			IDW Soils, Sludges, Slurries	MBD
SRS1025	SR-W025		SR-W025	Solvent/Job Control Waste <100 NCi/g	TAK/TAN
SRS1033	SR-W033		SR-10033	Thirds/TRU Job Control Waste < 100 NCi/g	TAK/TAN

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3a-SRS. Isotope Profile - PTCSD Stream MAS

Isotope	Concentration (Ci/M3)
Cs-137	
H-3	8.9280e+05
Pu-238	
Pu-239	
Sr-90	
U-235	

Table 3b-SRS. Isotope Profile - PTCSD Stream MAD

Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)
Am-241	3.9000e-06	Pm-147	2.2000e-07	Se-79	2.0000e-09
Ba-137m	5.6000e-04	Pr-144	0.0000e+00	Sn-126	5.0000e-09
Beta/Gamma	2.5000e-08	Pr-144m	0.0000e+00	Sr-90	7.0000e-06
C-14	1.0000e-12	Pu-238	9.0000e-05	Tc-99	6.0000e-06
Ce-144	3.5000e-15	Pu-239	3.0000e-05	U-233	3.0000e-11
Co-60	2.5000e-10	Pu-240	6.0000e-06	U-234	3.0000e-11
Cs-137	5.6000e-03	Pu-241	2.0000e-04	U-235	8.0000e-10
Gross Alpha	1.5000e-11	Pu-242	4.0000e-09	U-236	3.0000e-09
I-129	0.0000e+00	Rh-106	0.0000e+00	U-238	4.0000e-09
Ni-59	2.0000e-11	Ru-106	9.0000e-07	Y-90	0.0000e+00

Table 3c-SRS. Isotope Profile - PTCSD Stream MAW

Isotope	Concentration (Ci/M3)
Ag	6.0076e-05
Cd-109	1.6341e-03
Co-60	1.1775e-01
Cs-137	3.4596e-01
Fe-55	6.0076e-02
H-3	3.1658e+02
I-129	6.9866e-03
Ni	1.8263e-04
Pu-238	4.0959e-10
Pu-239	1.0109e-03
Pu-240	1.1232e-04
Sr-90	2.0480e-13
U-235	4.2458e-06
U-236	6.0655e-05
U-238	2.2465e-06

Table 3d-SRS. Isotope Profile - PTCSD Stream MAZ

Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)	Isotope	Conc (Ci/M3)
Ac-228	8.4107e-10	Na-22	2.4821e-11	Th-228	1.7990e-08
Am-241	1.7179e-06	Np-237	3.6786e-09	Th-230	2.5889e-09
Am-243	1.2143e-08	Pa-234m	1.1268e-08	Th-232	6.9107e-11
Bi-212	8.9821e-10	Pb-212	3.7321e-08	Th-234	4.2321e-08
Bi-214	6.6964e-08	Pb-214	5.8036e-08	Tl-208	7.0179e-10
Co-60	7.9643e-11	Pu-238	1.6036e-07	U-233	2.2385e-06
Cs-137	1.2625e-07	Pu-239	7.7884e-06	U-235	4.9150e-07
Eu-154	8.9821e-11	Pu-242	3.7812e-08	U-238	4.8302e-08
K-40	4.8571e-07	Ru-106	7.1607e-10		

Category 1 MLLW Streams: Generated by Sources Other than ER and Disposed by WM

Table 3e-SRS. MLLW Isotope Profile - PTCSD Stream MBA

Isotope	Concentration (Ci/M3)
Am-241	
Cs-137	
Pu-238	
Pu-239	
U-234	1.7050e-03
U-235	7.6066e-05
U-236	5.1146e-05
U-238	3.9143e-03

Table 3f-SRS. MLLW Isotope Profile - PTCSD Stream MBD

Isotope	Concentration (Ci/M3)
H-3	1.9000e-05

Table 3g-SRS. MLLW Isotope Profile - PTCSD Streams TAK/TAN

Isotope	Concentration (Ci/M3)
Am-241	
Beta/Gamma	
Cm-244	
Pu-238	
Pu-239	
Pu-240	
Pu-241	

DNFSB 94-2 Low-Level Waste Disposal Capacity Report

Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes

Background:

The purpose of this data summary is to ensure the field is cognizant of the methodology used to develop the radiological source term for EM-40 waste streams and the inherent uncertainties of the source term based on the initial source data and methodology.

To support preparation of the Department of Energy Low-Level Waste Disposal Capacity Report, the Office of Environmental Restoration (EM-40) was asked by the Office of Waste Management (EM-30) to supply information on the volume and radiological content of low-level waste (LLW) and mixed low-level waste (MLLW) projected to be disposed of in DOE LLW disposal facilities between 1998 and 2070. The waste addressed in the capacity analysis includes the EM-40-generated LLW and MLLW expected to be turned over to EM-30 for disposal as well as EM-40 LLW and MLLW streams which EM-40 expects to dispose of on-site in CERCLA disposal facilities that are in only the initial planning stages. The analysis excludes all waste disposed of at commercial disposal facilities as well as that waste projected to be disposed of in existing on-site CERCLA facilities at Hanford and Fernald. EM-30 further requested that the waste stream volume data addressed in the analysis be consistent with the data compiled in the *Paths to Closure* analysis.

While the disposal capacity analysis required data on both waste volume and radiological content, data collected under *Paths to Closure* included only addressed waste volume. Headquarters has not compiled data on the radiological content of the *Paths to Closure* waste streams. To supply data on the radiological content of *Paths to Closure* waste streams, EM-40 developed an estimate using contaminant data from other sources, primarily the EM-40 Core database and EM-30's 1997 data call for radiological data.

These sources contained radiological characterization data on some environmental restoration waste streams. However, in nearly all cases, the *Paths to Closure* streams do not correspond to streams in the Core database having radiological characterization data. To overcome this shortfall, EM-40 identified the waste streams with characterization data for each site in the Core database and developed composite radiological profiles based on several waste streams at each site. Each composite radiological profile was composed of individual radionuclide concentrations developed by summing volume-weighted radiological concentrations of each isotope identified in the characterization data, using the following formula:

$$C_i = \frac{\sum_{S=1}^{S=n} C_s \cdot V_s}{\sum_{S=1}^{S=n} V_s}$$

where:

C_i = Composite concentration of isotope

C_s = Concentration of isotope in stream S as given in the Core database

V_s = Life-cycle volume of stream S according to the Core database

In using this formula, it was often necessary to apply several simplifying assumptions (e.g., use of maximum constituent concentrations instead of average concentrations where no averages were available, or use of an assumed waste density to convert from mass- to volume-based concentrations).

The table on the following page lists the environmental restoration waste streams for which radiological profiles were developed for this project. The radiological profiles and the specific methodology, assumptions, and raw data used to develop the profiles are presented on subsequent pages.

DNFSB 94-2 Low-Level Waste Disposal Capacity Report

Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes

Ops Office	Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)	Disposal Facility
NV	NTS	01025	NVTS-08	LLW	LLW D & D Rubble & Liquid	440.00	NTS Disposal
NV	NTS	01226	NVTS-16	LLW	Treated MLLW Sludge/Soil/Rubble to NTS Disposal	11,008.80	NTS Disposal
NV	NTS	01227	NVTS-12	LLW	Treated LLW Soils	2,124.00	NTS Disposal
NV	NTS	01228	NVTS-09	LLW	Treated LLW Soils	201,562.00	NTS Disposal
OR	ORR	00167	GAO	LLW	Asbestos Rubble/Debris (to WM)	2,180.40	TBD Disposal
OR	ORR	00166	GBP	LLW	Asbestos Rubble/Debris	4,114.72	Future CERCLA On Site Disposal Cell
OR	ORR	P0156	GAB	LLW	LLW Sludge/Residues/Rubble Debris/Other Solids (to WM)	14,407.44	TBD Disposal
OR	ORR	02127	GGG	LLW	On Site Commercial Treatment Residues	3,679.00	TBD Disposal
OR	ORR	02135	GGC	MLLW	TBD - MLLW Treatment Residues	29,009.10	Future CERCLA On Site Disposal Cell
OR	ORR	00160	GAG	LLW	SEG Treatment Residuals	9.58	Future CERCLA On Site Disposal Cell
OR	ORR	00163	GAJ	LLW	Metal Treatment Residuals	98.45	Future CERCLA On Site Disposal Cell
OR	ORR	02134	GGA	LLW	TBD - Commercial Treatment Residues	55,315.40	Future CERCLA On Site Disposal Cell
OR	PGDP	00469	BBV	MLLW	Suspect MLLW Rubble/Debris	8.00	TBD DOE Off-Site Disposal
OR	PORT	00486	AAT	MLLW	Mixed Low-Level Waste Passive Treatment Media	156.00	TBD Disposal
OK	ETEC	01669	AA	LLW	LLW-Defense D&D Waste (from ER)	2,760.00	NTS LLW Disposal
OK	ETEC	01671	AC	LLW	LLW-Non-defense D&D Waste (from ER)	641.00	Hanford Disposal
OK	ETEC	01673	ADA	LLW	[Stabilized] Hydraulic Oil (from ER)	0.40	Hanford Disposal
OK	ETEC	01687	BJ	MLLW	MLLW-Soil (from ER)	1,365.00	TBD Treatment & Disposal
OK	GA	01720	CAA	LLW	[Characterized & Packaged] LLW Soil (HA)	336.00	Hanford Disposal (high activity)
OK	GA	01723	CBA	LLW	[Stabilized/Deactivated] MLLW Soil (HA)	1.00	Hanford Disposal (high activity)
OK	GE	01727	AB	LLW	LLW-Contaminated Rubble/Debris	20.00	Disposal TBD
OK	LEHR	01771	AA/AB/AC (from LLW Map)	LLW	[Vol. Reduced, Compacted, Packaged] Suspect LLW-Contaminated Soil/Debris	1,986.30	Hanford LLW Disposal
OK	LEHR	01775	AD/AE (from LLW Map)	LLW	[Stabilized & Packaged] Biological & Imhoff Sludge Waste	9.40	Hanford LLW Disposal
OK	SPRU	01842	AB	LLW	LLW- Contaminated Rubble from Storage & Collection Building (K5/6)	20.00	TBD LLW Disposition
OK	SPRU	01846	AD	LLW	LLW-Contaminated Rubble from Waste Baler (L7)	10.00	TBD LLW Disposition
OK	SPRU	01863	BBE	LLW	[Rinsed] LLW-Pipes, Tanks & Equipment	400.00	LLW Pipes, Tanks & Equipment (Disposition TBD)
OK	SPRU	01867	BE	LLW	LLW-Pipes, Tanks & Equipment (not rinsed)	400.00	TBD LLW Disposition
OK	SPRU	01870	BH	LLW	LLW- Contaminated Building Rubble	3,900.00	TBD LLW Disposition
OK	SPRU	01840	AA	LLW	LLW-Contaminated Soils from Storage & Collection Building	2,200.00	TBD LLW Disposition

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Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes

Ops Office	Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)	Disposal Facility
OK	SPRU	01844	AC	LLW	V		
OK	SPRU	01848	AE	LLW	LLW-Contaminated Soils from Lower Parking	10.00	TBD LLW Disposition
OK	SPRU	01850	AF	LLW	LLW-Contaminated Soils from Drum Storage	150.00	TBD LLW Disposition
OK	SPRU	01869	BG	LLW	LLW-Contaminated Soils	1,000.00	TBD LLW Disposition
OH	BCL	00003	A	LLW	LLW Soils from ER	130.00	TBD LLW Disposition
OH	BCL	00007	E	LLW	LLW Bulk Construction Debris (to HANF)	7,838.00	TBD Commercial or DOE
OH	BCL	00009	G	LLW	Compacted LLW	1,238.00	Hanford Disposal
OH	FEMP	00063	LLW-3	LLW	LLW Contaminated Soil	116.50	Hanford Disposal
OH	FEMP	00069	LLW-4B2	LLW	Treated Soil	20,603.00	NTS Disposal
OH	FEMP	00067	LLW-7	LLW	LLW Debris	9,800.00	NTS Disposal
OH	FEMP	00070	LLW-9	LLW	LLW Residues - Uranium	11,217.00	NTS Disposal
OH	FEMP	00073	LLW-13	LLW	LLW Residues - Thorium	4,910.00	NTS Disposal
OH	FEMP	00078	LLW-8B2	LLW	Treated Debris	1,120.00	NTS Disposal
OH	FEMP	00072	LLW-12	LLW	LLW Residues - Uranium	550.00	NTS Disposal
OH	FEMP	00074	LLW-14B	LLW	Treated Residues - Thorium	7,600.00	NTS Disposal
OH	FEMP	00079	LLW-10B	LLW	Treated Silo 3 Residues	240.00	NTS Disposal
OH	FEMP	00081	LLW-11B	LLW	Treated Silo 1 & 2 Residues	6,532.00	NTS Disposal
OH	FEMP	00083	LLW-17B2	LLW	Treated Sludge	15,264.00	NTS Disposal
OH	FEMP	01253	LLW-17A1	LLW	LLW-Contam Sludge	1,752.00	NTS Disposal
OH	FEMP	01256	LLW-17B3	LLW	Contaminated Sludge (PCBs Extracted)	1,754.00	NTS Disposal
OH	FEMP	00084	LLW-18A	LLW	LLW-Nuclear Materials Depleted	877.00	NTS Disposal
OH	FEMP	00085	LLW-18B	LLW	LLW-Nuclear Materials Enriched	596.00	NTS Disposal
OH	FEMP	00087	LLW-18D	LLW	LLW-Nuclear Materials Enriched (Stabilized & Blended)	182.00	NTS Disposal
OH	MEMP	02088	LLW-3A	LLW	Packaged/Characterized LLW (to NTS)	594.00	NTS Disposal
RF	RFTS	01384	ER-03B	LLW	Soil to LL	64,177.00	NTS Disposal
RF	RFTS	01374	ER-01A	LLW	LL ER Debris	21,525.00	NTS Disposal
RF	RFTS	01386	ER-04A	LLW	Sorted D&D LLW	230.40	NTS Disposal
RF	RFTS	PT003	M-01A-ER (from MLLW Map)	MLLW	Sorted Routine Ops/Deact Solids to Disposal (ER Portion)	23,062.00	NTS Disposal
RF	RFTS	PT007	M-01BA-ER (from MLLW Map)	MLLW	Treated Routine Ops/Deact Solids to Disposal (ER Portion)	30,391.25	TBD Off Site
SR	SRS	02202	BF	LLW	LLW Sludge (2 nd waste from AI)	30,391.25	TBD Off Site
SR	SRS	02184	AA	LLW	LLW Soil, Rubble, Debris (Dispose)	3,676.50	SRS Slit Trench
SR	SRS	02185	AB	LLW	LLW Vegetation	41,791.04	SRS Slit Trench
						344.50	SRS LAW Vault

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Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Albuquerque Operations Office

Table AL-1: Paths to Closure Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
GJO	01089	LLW002	LLW	LLW Contaminated Soil Samples	14.60
GJO	01090	LLW003	LLW	LLW Contaminated Rubble/Debris	40.00
LANL	00098	AB	LLW	LLW Rubble/Debris	3,800.00
LANL	00097	AA	LLW	LLW Soils/Residues	33,622.00
LANL	01300	LA-4	MLLW	Treated (Comm-Offsite) ER Waste	3,373.00
SNL	00235	SNL-ER-5	LLW	LLW Soils & Debris	1,387.00

Grand Junction Office

Waste Stream ID/Map ID: 01089 / LLW002

Stream Name: LLW Contaminated Soil Samples

Life-Cycle Volume: 14.60

**Table AL-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	CI/m ³
Th-232	1.41E-04
Ra-226	1.41E-04

Methodology and Assumptions

In the 1997 Core database there are 16 solid streams at GJO. Only two of these are LLW, and one of these is soil (Waste Management Operations Soil-001). The inventories for the *Paths to Closure* GJO LLW Contaminated Soil Samples stream and the Waste Management Operations Soil-001 stream in the Core are both cited as about 1 m³, and it was assumed that these two streams referred to the same waste. The radiological profile for the GJO LLW Contaminated Soil Samples stream is based on the Soil-001 stream in the Core.

To use the characterization data for this waste stream, the following simplifying assumptions were made:

- 1) Maximum reported concentration levels were used in place of average concentrations because no average values were provided for this waste stream in the Core database.
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Gross alpha concentrations are assumed to be based on the U-238 decay chain, excluding the uranium isotopes. As such, alpha emissions come from six nuclides: Th-230, Ra-226, Rn-222, Po-218, Po-214, and Po-210. Only 2 of these, Th-230 and Ra-226, are long-lived. It was assumed, therefore, that a gross alpha concentration of X pCi/g was equivalent to a concentration of 0.167 X pCi/g of Th-230 and 0.167 X pCi/g of Ra-226.
- 4) Gross beta-gamma concentrations represent the same nuclides as those identified for gross alpha concentrations.

Table AL-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
WASTE MANAGEMENT OPERATIONS	Soil-001	CD8	LLW	1.46	BETA-(gross)		683	pCi/g
WASTE MANAGEMENT OPERATIONS	Soil-001	CD8	LLW	1.46	ALPHA-(gross)		770	pCi/g
WASTE MANAGEMENT OPERATIONS	Soil-001	CD8	LLW	1.46	BETA-(gross)		683	pCi/g
WASTE MANAGEMENT OPERATIONS	Soil-001	CD8	LLW	1.46	ALPHA-(gross)		770	pCi/g

Grand Junction Office

Waste Stream ID/Map ID: 01090 / LLW003

Stream Name: LLW Contaminated Soil Samples

Life-Cycle Volume: 40.00

Table AL-4: Radiological Profile for Paths to Closure Waste Streams

Nuclide	Ci/m ³
Th-232	1.22E-04
Ra-226	1.22E-04

Methodology and Assumptions

In the 1997 Core database there are 16 solid streams at GJO. Only two of these are LLW, and one of these is an OtherSolid (Waste Management Operations OtherSolid-001). The inventories for the *Paths to Closure* GJO LLW Contaminated Rubble/Debris stream and the Waste Management Operations OtherSolid-001 stream in the Core are both cited as about 4 m³, and it was assumed that these two streams referred to the same waste. The radiological profile for the GJO LLW Contaminated Rubble/Debris stream is based on the OtherSolid-001 stream in the Core.

To use the characterization data for this waste stream, the following simplifying assumptions were made:

- 1) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 2) Gross alpha concentrations are assumed to be based on the U-238 decay chain, excluding the uranium isotopes. As such, alpha emissions come from six nuclides: Th-230, Ra-226, Rn-222, Po-218, Po-214, and Po-210. Only 2 of these, Th-230 and Ra-226, are long-lived. It was assumed, therefore, that a gross alpha concentration of X pCi/g was equivalent to a concentration of 0.167 X pCi/g of Th-230 and 0.167 X pCi/g of Ra-226.
- 3) Gross beta-gamma concentrations represent the same nuclides as those identified for gross alpha concentrations.

Table AL-5: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
WASTE MANAGEMENT OPERATIONS	OtherSolid-001	CD7	LLW	4.38	BETA-GAMMA-(total)	2000	2000	pCi/g
WASTE MANAGEMENT OPERATIONS	OtherSolid-001	CD7	LLW	4.38	ALPHA-(gross)	2000	2000	pCi/g
WASTE MANAGEMENT OPERATIONS	Soil-001	CD6	LLW	1.46	BETA-(gross)		683	pCi/g
WASTE MANAGEMENT OPERATIONS	Soil-001	CD6	LLW	1.46	ALPHA-(gross)		770	pCi/g

**Table AL-6: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
U-234	7.56E-05
U-235	3.72E-06
U-238	8.07E-05

Methodology and Assumptions

In the 1997 Core database, there are five characterized solid ex-situ LLW & MLLW streams, including two LLW soil (from Field Units 1 and 6), one MLLW soil (from Field Unit 2), one LLW Concrete/Brick (from Field Unit 6), and one LLW metal (from Field Unit 6). The radiological profile for LANL *Paths to Closure* LLW Rubble/Debris is based on a composite of the concrete/brick and metal streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 2) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).

Table AL-7: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
FIELD UNIT 6 (D&D)	Concrete/Brick-01	3D2	LLW	1,620	URANIUM	100	1,400,000	pCi/g
FIELD UNIT 6 (D&D)	Metal-01	3D6	LLW	750	URANIUM	100	1,400,000	pCi/g

**Table AL-8: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
U-234	3.00E-04
U-235	1.48E-05
U-238	3.21E-04

Methodology and Assumptions

In the 1997 Core database, there are five characterized solid ex-situ LLW & MLLW streams, including two LLW soil (from Field Units 1 and 6), one MLLW soil (from Field Unit 2), one LLW Concrete/Brick (from Field Unit 6), and one LLW metal (from Field Unit 6). The radiological profile for LANL *Paths to Closure* LLW Soils/Residues is based on a composite of the three soil streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 2) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).

Table AL-9: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	U
FIELD UNIT 1	Soil-01	3D2	LLW	4,521	URANIUM	500	20000	p
FIELD UNIT 2	Soil-01	3D1	MLLW	845.00	URANIUM	1	50	p
FIELD UNIT 6 (D&D)	Soil-01	3D5	LLW	430.00	URANIUM	100	1400000	p

**Table AL-10: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	CI/m ³
U-234	1.10E-07
U-235	5.42E-09
U-238	1.18E-07

Methodology and Assumptions

In the Core, there are five characterized solid ex-situ LLW & MLLW streams, including two LLW soil (from Field Units 1 and 6), one MLLW soil (from Field Unit 2), one LLW Concrete/Brick (from Field Unit 6), and one LLW metal (from Field Unit 6). The radiological profile for LANL *Paths to Closure* MLLW Rubble/Debris is based the MLLW stream.

To use the characterization data for this waste stream, the following simplifying assumptions were made:

- 1) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 2) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).

Table AL-11: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
FIELD UNIT 2	Soil-01	3D1	MLLW	845.00	URANIUM	1	50	pCi/g

Methodology and Assumptions

The 1997 Core database identified only a single solid LLW/MLLW stream at SNLN and quantified only tritium as a contaminant. No characterization data is present for SNLN in the 1997 EM-30 Data Call. Because there was no reasonably complete characterization data for LLW/MLLW at SNLN, a default radiological profile was used for this waste stream. The default radiological profile is based on a composite of all DOE LLW/MLLW to be disposed of at NTS.

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Chicago Operations Office

Table CH-1: *Paths to Closure* Environmental Restoration Waste Streams (ANL-East)

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
ANLE	01133	AD	LLW	LLW-Contaminated Rubble/Debris (D&D)	412.00
ANLE	01138	AH	MLLW	Secondary MLLW GW Treatment Waste	664.00
ANLE	01147	AQ	LLW	LLW-Contaminated D&D Rubble/Debris	41.50
ANLE	01149	AU	LLW	LLW-Contaminated D&D Rubble/Debris (Metal)	324.00
ANLW	02284	AA	LLW	LLW Contaminated Rubble/Debris	142.00
ANLW	00812	AB (from LLW Map)	LLW	ANLW Supplemental DD LLW	1,038.79
BNL	00027	LLW-9	LLW	OUI Legacy Solid Chem	1,405.00
BNL	00035	LLW-13	LLW	OU V Sediment	6,956.00
BNL	00037	LLW-14	LLW	BGRR	9,000.00
BNL	02286	LLW-16	LLW	RA VI Chemical Holes - Rubble/Debris	1,060.00

Argonne National Laboratory – East

Waste Stream ID/Map ID: 01133 / AD
Waste Stream ID/Map ID: 01138 / AH
Waste Stream ID/Map ID: 01147 / AQ
Waste Stream ID/Map ID: 01149 / AU

Stream Name: LLW-Contaminated Rubble/Debris (D&D)
Stream Name: Secondary MLLW GW Treatment Waste
Stream Name: LLW-Contaminated D&D Rubble/Debris
Stream Name: LLW-Contaminated D&D Rubble/Debris (Metal)

Life-Cycle Volume: 412.00
Life-Cycle Volume: 664.00
Life-Cycle Volume: 41.50
Life-Cycle Volume: 324.00

Table CH-2: Radiological Profile for Paths to Closure Waste Streams

Nuclide	CI/m ³
Cs-137	1.26E-07
Fe	5.34E-05
Am-241	1.17E-06
Cs-134	8.16E-08
Co-60	6.65E-04
Eu-152	4.70E-05
Eu-154	8.30E-07
Mn-54	5.84E-05
Ra-226	6.47E-07

Methodology and Assumptions

In the 1997 Core database, there are four characterized solid LLW/MLLW streams for ANLE, including one MLLW soil managed in-situ & three LLW metal streams without identified responses. The radiological profile for the four Paths to Closure ANLE ER-to-WM LLW rubble/debris streams is based on a weighted composite of the three metal streams in the Core database.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) Data on concentrations of gross alpha and gross beta were assumed to be included in the concentrations of specific nuclides that are represented elsewhere in the data (e.g., under Am-241 and Co-60)
- 3) Iron was assumed to be Fe-55.
- 4) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table CH-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
REACTOR FACILITIES	Metal-001	131.00	COBALT-60		520	pCi/g
REACTOR FACILITIES	Metal-001	131.00	EUROPIUM-152		27.5	pCi/g
REACTOR FACILITIES	Metal-001	131.00	IRON		42	pCi/g
REACTOR FACILITIES	Metal-001	131.00	MANGANESE-54		46	pCi/g
REACTOR FACILITIES	Metal-003	29.00	CESIUM-134		0.29	pCi/g
REACTOR FACILITIES	Metal-003	29.00	COBALT-60		16.5	pCi/g
REACTOR FACILITIES	Metal-003	29.00	EUROPIUM-152		42.9	pCi/g
REACTOR FACILITIES	Metal-003	29.00	EUROPIUM-154		2.95	pCi/g
REACTOR FACILITIES	Metal-003	29.00	RADIUM-226		2.3	pCi/g
SUPPORT FACILITIES	Metal-002	5.00	ALPHA-(gross)		19.2	pCi/g
SUPPORT FACILITIES	Metal-002	5.00	AMERICIUM-241		24.1	pCi/g

Argonne National Laboratory – East

Waste Stream ID/Map ID: 01133 / AD

Waste Stream ID/Map ID: 01138 / AH

Waste Stream ID/Map ID: 01147 / AQ

Waste Stream ID/Map ID: 01149 / AU

Stream Name: LLW-Contaminated Rubble/Debris (D&D)

Stream Name: Secondary MLLW GW Treatment Waste

Stream Name: LLW-Contaminated D&D Rubble/Debris

Stream Name: LLW-Contaminated D&D Rubble/Debris (Metal)

Life-Cycle Volume: 412.00

Life-Cycle Volume: 664.00

Life-Cycle Volume: 41.50

Life-Cycle Volume: 324.00

Core Reporting Level	WS ID	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
SUPPORT FACILITIES	Metal-002	5.00	BETA-(gross)		4.3	pCi/g
SUPPORT FACILITIES	Metal-002	5.00	CESIUM-137		2.6	pCi/g
SUPPORT FACILITIES	Metal-002	5.00	COBALT-60		4.3	pCi/g

Argonne National Laboratory – West

Waste Stream ID/Map ID: 02284 / AA

Stream Name: LLW Contaminated Rubble/Debris

Life-Cycle Volume: 142.00

Waste Stream ID/Map ID: 00812 / AB (from
LLW Map)

Stream Name: ANLW Supplemental DD LLW

Life-Cycle Volume: 1,038.79

**Table CH-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	CI/m ³
Am-241	8.00E-06
Ba-137m	8.00E-04
Cd-113m	9.00E-07
Ce-144	7.70E-04
Cm-244	2.50E-07
Co-58	3.00E-05
Co-60	9.50E-04
Cs-134	1.00E-04
Cs-137	1.00E-03
Eu-154	2.00E-05
Eu-155	0.00E+00
Fe-55	8.40E-02
H-3	8.00E-06
La-140	0.00E+00
Mn-54	8.00E-03
Na-22	0.00E+00
Nb-93m	0.00E+00
Ni-59	8.00E-06
Ni-63	3.50E-04
Pm-147	1.00E-03
Pr-144	7.70E-04
Pr-144m	4.00E-05
Pu-238	2.00E-06
Pu-239	4.50E-05
Pu-240	5.00E-05
Pu-241	8.50E-04
Rh-106	9.00E-04
Ru-106	7.00E-04
Sb-125	9.50E-05

Methodology and Assumptions

The Core database does not contain characterization data for any ANLW LLW/MLLW streams. However, the 1997 EM-30 data call identified five ANLW LLW streams, four of which are contact-handled debris and one of which is a chemical residue treated onsite. The radiological profile for the two *Paths to Closure* ANLW ER-to-WM LLW streams is based on a weighted composite of the four debris streams.

Argonne National Laboratory – West

Waste Stream ID/Map ID: 02284 / AA

Stream Name: LLW Contaminated Rubble/Debris

Life-Cycle Volume: 142.0

Waste Stream ID/Map ID: 00812 / AB (from
LLW Map)

Stream Name: ANLW Supplemental DD LLW

Life-Cycle Volume: 1,038

Nuclide	CI/m ³
Sm-151	8.00E-05
Sr-90	1.50E-03
Y-90	1.50E-03

Table CH-5: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
ANLW0020	ANLW Sitewide Incinerable Contact-Handled LLW	4,648.00
ANLW0021	ANLW Sitewide Compactible Contact-Handled LLW	1,746.00
ANLW0023	ANLW Sitewide Sizeable Contact-Handled LLW	222.00
ANLW0024	ANLW Sitewide Nonprocessable Contact-Handled LLW	2,744.00

Brookhaven National Laboratory

Waste Stream ID/Map ID: 00027 / LLW-9
Waste Stream ID/Map ID: 00035 / LLW-13
Waste Stream ID/Map ID: 00037 / LLW-14
Waste Stream ID/Map ID: 02286 / LLW-16

Stream Name: OUI Legacy Solid Chem
Stream Name: OU V Sediment
Stream Name: BGRR
Stream Name: RA VI Chemical Holes - Rubble/Debris

Life-Cycle Volume: 1,405.00
Life-Cycle Volume: 6,956.00
Life-Cycle Volume: 9,000.00
Life-Cycle Volume: 1,060.00

Table CH-6: Radiological Profile for Paths to Closure Waste Streams

Nuclide	Ci/m ³
Am-241	2.948E-07
Cs-137	5.609E-03
Co-60	1.301E-05
Eu-152	8.217E-06
Eu-154	5.049E-06
H-3	4.131E-04
Pb-210	3.120E-08
Pu-239	1.746E-06
Ra-226	1.190E-08
Sr- 90	3.439E-03
Th-228	1.179E-07
Th-230	1.306E-07
Th-232	1.057E-07
U-234	7.640E-07
U-235	2.698E-07
U-238	5.847E-07

Methodology and Assumptions

In the 1997 Core database, there are 13 characterized solid LLW/MLLW streams, all with ex-situ responses, for BNL:

Core Reporting Level (CRL) OU5: 2 LLW sludge

CRL OU1 & 6: 3 LLW soil and 1 LLW soil

CRL OU2 & 7: 2 LLW soil

CRL OU3: 1 LLW soil

CRL OU4: 2 LLW soil

CRL Removals: 2 MLLW sludge

The radiological profile for BNL waste streams OUI Legacy Solid Chem, OU V Sediment, BGRR, and RA VI Chemical Holes Rubble/Debris is based on a composite of these 13 streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used for Pb-210 (no average concentration for Pb-210 was in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table CH-7: Raw Data used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 1 & 6	Soil-001	CD1	MLLW	111.00	CESIUM-137	3958		pCi/g
OU 1 & 6	Soil-001	CD1	MLLW	111.00	STRONTIUM- 90	29		pCi/g
OU 1 & 6	Soil-002	CD3	LLW	1,835.00	CESIUM-137	1150	2800	pCi/g
OU 1 & 6	Soil-003	CD4	LLW	535.00	CESIUM-137	2800		pCi/g
OU 1 & 6	Soil-01	CD2	LLW	24,016.00	STRONTIUM- 90	29	1300	pCi/g
OU 1 & 6	Soil-01	CD2	LLW	24,016.00	CESIUM-137	3958	810000	pCi/g
OU 2 & 7	Soil-001	CD2	LLW	1,200.00	CESIUM-137	43	348	pCi/g

Brookhaven National Laboratory

Waste Stream ID/Map ID: 00027 / LLW-9
Waste Stream ID/Map ID: 00035 / LLW-13
Waste Stream ID/Map ID: 00037 / LLW-14
Waste Stream ID/Map ID: 02286 / LLW-16

Stream Name: OUI Legacy Solid Chem
Stream Name: OU V Sediment
Stream Name: BGRR
Stream Name: RA VI Chemical Holes - Rubble/Debris

Life-Cycle Volume: 1,405.00
Life-Cycle Volume: 6,956.00
Life-Cycle Volume: 9,000.00
Life-Cycle Volume: 1,060.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 2 & 7	Soil-001	CD2	LLW	1,200.00	EUROPIUM-152	2.5	5	pCi/g
OU 2 & 7	Soil-001	CD2	LLW	1,200.00	EUROPIUM-154	2.5	5	pCi/g
OU 2 & 7	Soil-001	CD2	LLW	1,200.00	STRONTIUM-90	1.5	6	pCi/g
OU 2 & 7	Soil-001	CD2	LLW	1,200.00	THORIUM-230	1	29	pCi/g
OU 2 & 7	Soil-01	CD1	LLW	208.00	CESIUM-137	51	464	pCi/g
OU 2 & 7	Soil-01	CD1	LLW	208.00	STRONTIUM-90	77	454	pCi/g
OU-3	Soil-02	CD2	LLW	305.00	CESIUM-137	68	105	pCi/g
OU-4	Soil-001	CD1	LLW	1,063.00	COBALT-60	38	150	pCi/g
OU-4	Soil-001	CD1	LLW	1,063.00	EUROPIUM-154	88	350	pCi/g
OU-4	Soil-001	CD1	LLW	1,063.00	STRONTIUM-90	35	140	pCi/g
OU-4	Soil-001	CD1	LLW	1,063.00	EUROPIUM-152	145	580	pCi/g
OU-4	Soil-001	CD1	LLW	1,063.00	CESIUM-137	450	1800	pCi/g
OU-4	Soil-002	CD2	LLW	795.00	PLUTONIUM-239	42	170	pCi/g
OU-4	Soil-002	CD2	LLW	795.00	URANIUM-234	7.8	31	pCi/g
OU-4	Soil-002	CD2	LLW	795.00	URANIUM-238	13	51	pCi/g
OU-4	Soil-002	CD2	LLW	795.00	AMERICIUM-241	6.5	28	pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	HYDROGEN-3	1.07	0	pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	RADIUM-228	0.81		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	THORIUM-230	1.18		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	CESIUM-137	21.5	0	pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	STRONTIUM-90	9.18	0	pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	THORIUM-232	0.76		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	URANIUM-234	4.09		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	THORIUM-228	1.09		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	URANIUM-238	3.01		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	AMERICIUM-241	1.67		pCi/g
OU-5	Sludge-01	CT1	LLW	281.00	COBALT-60	1.28	0	pCi/g
OU-5	Sludge-02	CD12	LLW	221.00	LEAD-210		2.7	pCi/g
OU-5	Sludge-02	CD12	LLW	221.00	CESIUM-137	24.7	98.8	pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	CESIUM-137	379000		pCi/g

Brookhaven National Laboratory

Waste Stream ID/Map ID: 00027 / LLW-9
Waste Stream ID/Map ID: 00035 / LLW-13
Waste Stream ID/Map ID: 00037 / LLW-14
Waste Stream ID/Map ID: 02286 / LLW-16

Stream Name: OUI Legacy Solid Chem
Stream Name: OU V Sediment
Stream Name: BGRR
Stream Name: RA VI Chemical Holes - Rubble/Debris

Life-Cycle Volume: 1,405.00
Life-Cycle Volume: 6,956.00
Life-Cycle Volume: 9,000.00
Life-Cycle Volume: 1,060.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	THORIUM-228	97.4		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	HYDROGEN-3	395000		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	STRONTIUM- 90	3250000		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	URANIUM-235	258		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	THORIUM-232	90.4		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	COBALT-60	10400		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	URANIUM-234	363		pCi/g
REMOVAL ACTIVITIES	Sludge-001	CD12	MLLW	20.00	THORIUM-230	48.3		pCi/g
REMOVAL ACTIVITIES	Sludge-02	CD10	MLLW	9.27	CESIUM-137	3610		pCi/L
REMOVAL ACTIVITIES	Sludge-02	CD10	MLLW	9.27	HYDROGEN-3	28.7		pCi/g

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Idaho Operations Office

Table ID-1: *Paths to Closure* Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
INEEL	02426	AC	LLW	LLW Soil/Rubble/Debris	328,507.03
INEEL	02464	ATA	LLW	LLW Soil/Rubble/Debris	6.46
INEEL	02436	AKA	MLLW	MLLW Soil, Rubble/Debris	51,452.00
INEEL	02437	AKB	MLLW	MLLW Soil, Rubble/Debris	5,718.02
INEEL	02462	ASA	LLW	LLW Liquid	0.80
INEEL	02476	BAA	MLLW	MLLW Sludge	750.00
INEEL	02480	BCA	MLLW	MLLW Sludge	369.00
INEEL	02429	AF	LLW	LLW Soil	1,000.00
INEEL	02427	AD	MLLW	MLLW Soil	5,803.00
INEEL	02470	AXA	MLLW	MLLW Soil	120.75
INEEL	02473	AZ	MLLW	MLLW Soil	300.00
INEEL	02428	AE	MLLW	MLLW Rubble/Debris	23.00
INEEL	02432	AI	MLLW	MLLW Rubble/Debris	10.00
INEEL	P2431	AH	MLLW	MLLW Rubble/Debris	57.78

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Waste Stream ID/Map ID: 02426 / AC
Waste Stream ID/Map ID: 02464 / ATA
Waste Stream ID/Map ID: 02436 / AKA
Waste Stream ID/Map ID: 02437 / AKB

Stream Name: LLW Soil/Rubble/Debris
Stream Name: LLW Soil/Rubble/Debris
Stream Name: MLLW Soil, Rubble/Debris
Stream Name: MLLW Soil, Rubble/Debris

Life-Cycle Volume: 328,50
Life-Cycle Volume: 6.46
Life-Cycle Volume: 51,457
Life-Cycle Volume: 5,718.

**Table ID-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Cs-137	2.021E-03
Co-60	1.277E-05
Sr- 90	5.715E-04
U-234	1.042E-06
U-235	8.246E-08
U-238	1.606E-06

Methodology and Assumptions

In the 1997 Core database, there are two solid MLLW streams and seven solid LLW streams for ID that have characterization data. The two MLLW streams are rubble/debris from the CFA (WAG 4). The seven LLW streams include six streams from TAN (WAG 1) (two OtherSolids, three rubble/d and one soil) and 1 soil stream from ICPP (WAG 3). The radiological profile for the four INEEL, to Closure LLW and MLLW soil/rubble/debris streams is based on a composite of the seven Core streams with media types of either soil or rubble/debris.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations for several radionuclides (strontium-90, cobalt-60, and cesium-137) given in mg were interpreted as being in pCi/g.

Table ID-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-04	CD5	LLW	285.00	CESIUM-137		30400
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-04	CD5	LLW	285.00	COBALT-60		329
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-04	CD5	LLW	285.00	STRONTIUM- 90		960
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-06	CD7	LLW	10.00	CESIUM-137		8.43
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-06	CD7	LLW	10.00	COBALT-60		3.8
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-06	CD7	LLW	10.00	STRONTIUM- 90		405
Test Area North (including Groundwater) (WAG 1)	Rubble/Debris-09	CD10	LLW	3.20	CESIUM-137		103
Test Area North (including Groundwater) (WAG 1)	Soil-07	CT14	LLW	1,133.00	CESIUM-137		103
Test Area North (including Groundwater) (WAG 1)	Soil-07	CT14	LLW	1,133.00	STRONTIUM- 90		555
ICPP (WAG 3)	Soil-51	CD34	LLW	10,000.00	STRONTIUM- 90		328.8
ICPP (WAG 3)	Soil-51	CD34	LLW	10,000.00	CESIUM-137		606
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	STRONTIUM- 90		7
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	CESIUM-137		2.3
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	URANIUM-238		37
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	URANIUM-235		1.9

Idaho National Engineering and Environmental Laboratory

Waste Stream ID/Map ID: 02426 / AC
Waste Stream ID/Map ID: 02464 / ATA
Waste Stream ID/Map ID: 02436 / AKA
Waste Stream ID/Map ID: 02437 / AKB

Life-Cycle Volume: 328,507.03
Life-Cycle Volume: 6.46
Life-Cycle Volume: 51,452.00
Life-Cycle Volume: 5,718.02

Stream Name: LLW Soil/Rubble/Debris
Stream Name: LLW Soil/Rubble/Debris
Stream Name: MLLW Soil, Rubble/Debris
Stream Name: MLLW Soil, Rubble/Debris

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	URANIUM-234		24	pCi/g
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	CESIUM-137		2.3	pCi/g
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	STRONTIUM-90		7	pCi/g
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	URANIUM-235		1.9	pCi/g
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	URANIUM-234		24	pCi/g
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	URANIUM-238		37	pCi/g

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Waste Stream ID/Map ID: 02462 / ASA
Waste Stream ID/Map ID: 02476 / BAA
Waste Stream ID/Map ID: 02480 / BCA

Stream Name: LLW Liquid
Stream Name: MLLW Sludge
Stream Name: MLLW Sludge

Life-Cycle Volume: 0.80
Life-Cycle Volume: 750.00
Life-Cycle Volume: 369.00

**Table ID-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Sr- 90	4.960E-04
Cs-137	3.744E-03

Methodology and Assumptions

In the 1997 Core database, there are two solid MLLW streams and seven solid LLW streams for INEEL that have characterization data. The two MLLW streams are rubble/debris from the CFA (WAG 4). The seven LLW streams include six streams from TAN (WAG 1) (two OtherSolids, three rubble/debris, and one soil) and one soil stream from ICPP (WAG 3). The radiological profile for the three INEEL *Paths to Closure* LLW Liquid and MLLW Sludge streams is based on a composite of the two Core streams with the OtherSolid media type.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations for strontium-90 and cesium-137 given in mg/kg were interpreted as being in pCi/g.

Table ID-5: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
Test Area North (including Groundwater) (WAG 1)	OtherSolid-02	CT18	LLW	9.70	STRONTIUM- 90		310	mg/kg
Test Area North (including Groundwater) (WAG 1)	OtherSolid-02	CT18	LLW	9.70	CESIUM-137		2340	mg/kg
Test Area North (including Groundwater) (WAG 1)	OtherSolid-03	CT4	LLW	76.50	CESIUM-137		2340	mg/kg
Test Area North (including Groundwater) (WAG 1)	OtherSolid-03	CT4	LLW	76.50	STRONTIUM- 90		310	mg/kg

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Waste Stream ID/Map ID: 02429 / AF
Waste Stream ID/Map ID: 02427 / AD
Waste Stream ID/Map ID: 02470 / AXA
Waste Stream ID/Map ID: 02473 / AZ

Stream Name: LLW Soil
Stream Name: MLLW Soil
Stream Name: MLLW Soil
Stream Name: MLLW Soil

Life-Cycle Volume: 1,000.00
Life-Cycle Volume: 5,803.00
Life-Cycle Volume: 120.75
Life-Cycle Volume: 300.00

**Table ID-6: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	CI/m ³
Cs-137	8.877E-04
Sr-90	5.629E-04

Methodology and Assumptions

In the 1997 Core database, there are two solid MLLW streams and seven solid LLW streams for INEEL that have characterization data. The two MLLW streams are rubble/debris from the CFA (WAG 4). The seven LLW streams include six streams from TAN (WAG 1) (two OtherSolids, three rubble/debris, and one soil) and one soil stream from ICPP (WAG 3). The radiological profile for the four INEEL *Paths to Closure* LLW and MLLW soil streams is based on a composite of the two Core streams with a media type of soil.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations for several radionuclides (strontium-90 and cesium-137) given in mg/kg were interpreted as being in pCi/g.

Table ID-7: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
Test Area North (including Groundwater) (WAG 1)	Soil-07	CT14	LLW	1,133.00	CESIUM-137		103	mg/kg
Test Area North (including Groundwater) (WAG 1)	Soil-07	CT14	LLW	1,133.00	STRONTIUM- 90		555	mg/kg
ICPP (WAG 3)	Soil-51	CD34	LLW	10,000.00	STRONTIUM- 90		328.8	mg/kg
ICPP (WAG 3)	Soil-51	CD34	LLW	10,000.00	CESIUM-137		606	mg/kg

Idaho National Engineering and Environmental Laboratory

Waste Stream ID/Map ID: 02428 / AE

Waste Stream ID/Map ID: 02432 / AI

Waste Stream ID/Map ID: P2431 / AH

Stream Name: MLLW Rubble/Debris

Stream Name: MLLW Rubble/Debris

Stream Name: MLLW Rubble/Debris

Life-Cycle Volume: 23.00

Life-Cycle Volume: 10.00

Life-Cycle Volume: 57.78

**Table ID-8: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Cs-137	3.680E-06
Sr- 90	1.120E-05
U-234	3.840E-05
U-235	3.040E-06
U-238	5.920E-05

Methodology and Assumptions

In the 1997 Core database, there are two solid MLLW streams and seven solid LLW streams for INEEL that have characterization data. The two MLLW streams are rubble/debris from the CFA (WAG 4). The seven LLW streams include one stream from TAN (WAG 1) (two OtherSolids, three rubble/debris, and one soil) and one soil stream from ICPP (WAG 3). The radiological profile for the three *Paths to Closure* MLLW Rubble/Debris stream is based on a composite of the two MLLW rubble/debris streams in the Core Database.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table ID-9: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Uni
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	CESIUM-137		2.3	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	STRONTIUM- 90		7	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	URANIUM-234		24	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	URANIUM-235		1.9	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-11	CT2	MLLW	0.03	URANIUM-238		37	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	CESIUM-137		2.3	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	STRONTIUM- 90		7	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	URANIUM-234		24	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	URANIUM-235		1.9	pCi
Central Facilities Area (WAG 4)	Rubble/Debris-12	CT3	MLLW	318.67	URANIUM-238		37	pCi

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Nevada Operations Office

Table NV-1: *Paths to Closure* Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
NTS	01025	NVTS-08	LLW	LLW D & D Rubble & Liquid	440.00
NTS	01226	NVTS-16	LLW	Treated MLLW Sludge/Soil/Rubble to NTS Disposal	11,008.80
NTS	01227	NVTS-12	LLW	Treated LLW Soils	2,124.00
NTS	01228	NVTS-09	LLW	Treated LLW Soils	201,562.00

Nevada Test Site

Waste Stream ID/Map ID: 01025 / NVTs-08

Stream Name: LLW D & D Rubble & Liquid

Life-Cycle Volume: 440.00

**Table NV-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Cd-113m	4.160E-07
Cs-137	1.568E-04
Eu-152	6.400E-06
Eu-154	1.152E-06
Sm-151	4.480E-06
Sr-90	1.504E-04
Tc-99	6.400E-08
Tn-121	2.880E-07

Methodology and Assumptions

In the 1997 Core database, there are only five solid LLW/MLLW streams with characterization data for NTS: one LLW rubble/debris stream and four LLW soil streams. The radiological profile for the NTS *Paths to Closure* LLW D & D Rubble & Liquid stream is based on the radiological data for the rubble/debris stream in the Core database.

To use the characterization data for this waste stream, the following simplifying assumptions were made:

- 1) The "Radioactive (Unspecified/Other)" contaminant identified in the Core database was assumed to correspond to mixed fission products. A mixed fission products standard profile was used, based on that used for MLLW in the Analysis of the Technical Capabilities of DOE Sites for Disposal of Residuals from the Treatment of Mixed Low-Level Waste (SNL, 1997).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table NV-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
DECONTAMINATION & DECOMMISSIONING FACILITIES	Rubble/Debris-04	3D1	LLW	240.00	RADIOACTIVE (UNSPECIFIED/OTHER)	200	10000	pCi/g

Nevada Test Site

Waste Stream ID/Map ID: 01226 / NVTS-16

Stream Name: Treated MLLW Sludge/Soil/Rubble
to NTS Disposal

Life-Cycle Volume: 11,008.80

Waste Stream ID/Map ID: 01227 / NVTS-12

Stream Name: Treated LLW Soils

Life-Cycle Volume: 2,124.00

Waste Stream ID/Map ID: 01228 / NVTS-09

Stream Name: Treated LLW Soils

Life-Cycle Volume: 201,562.00

**Table NV-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	CI/m ³
Cd-113m	3.525E-07
Cs-137	1.329E-04
Eu-152	5.424E-08
Eu-154	9.762E-07
Pu-239	4.882E-05
Sm-151	3.796E-06
Sr-90	1.275E-04
Tc-99	5.424E-08
Tn-121	2.441E-07

Methodology and Assumptions

In the 1997 Core database, there are only five solid LLW/MLLW streams with characterization data for NTS: one LLW rubble/debris stream and four LLW soil streams. One of the soil streams was excluded from the analysis (Industrial Sites, Soil-02) because it was believed that it was going to be managed in-situ. The radiological profile for these three NTS *Paths to Closure* streams is based on a composite of the other three soil streams in the Core database.

To use the characterization data for this waste stream, the following simplifying assumptions were made:

- 1) The "Radioactive (Unspecified/Other)" contaminant identified in the Core database was assumed to correspond to mixed fission products. A mixed fission products standard profile was used, based on that used for MLLW in the Analysis of the Technical Capabilities of DOE Sites for Disposal of Residuals from the Treatment of Mixed Low-Level Waste (SNL, 1997).
- 2) Plutonium was assumed to be 100% Pu-239.
- 3) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table NV-5: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m3)	Nuclide	Average Concentration	Maximum Concentration	Units
SOIL MEDIA	Soil-02	3D1	LLW	281,350	PLUTONIUM	200	10000	pCi/g
SOIL MEDIA	Soil-03	3D2	LLW	1,580,570	RADIOACTIVE (UNSPECIFIED/OTHER)	200	10000	pCi/g
SOIL MEDIA	Soil-04	3D3	LLW	2,120	RADIOACTIVE (UNSPECIFIED/OTHER)	200	10000	pCi/g

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Oak Ridge Operations Office

Table OR-1: *Paths to Closure* Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
ORR	00167	GAO	LLW	Asbestos Rubble/Debris (to WM)	2,180.40
ORR	00166	GBP	LLW	Asbestos Rubble/Debris	4,114.72
ORR	P0156	GAB	LLW	LLW Sludge/Residues/Rubble Debris/Other Solids (to WM)	14,407.44
ORR	02127	GGG	LLW	On Site Commercial Treatment Residues	3,679.00
ORR	02135	GGC	MLLW	TBD – MLLW Treatment Residues	29,009.10
ORR	00160	GAG	LLW	SEG Treatment Residuals	9.58
ORR	00163	GAJ	LLW	Metal Treatment Residuals	98.45
ORR	02134	GGA	LLW	TBD – Commercial Treatment Residues	55,315.40
PGDP	00469	BBV	MLLW	Suspect MLLW Rubble/Debris	8.00
PORT	00486	AAT	MLLW	Mixed Low-Level Waste Passive Treatment Media	156.00

Oak Ridge Operations Office

Waste Stream ID/Map ID: 00167 / GAO
Waste Stream ID/Map ID: 00166 / GBP

Stream Name: Asbestos Rubble/Debris (to WM)
Stream Name: Asbestos Rubble/Debris

Life-Cycle Volume: 2,180.40
Life-Cycle Volume: 4,114.72

**Table OR-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Cs-137	4.800E-04
Sr-90	4.800E-04

Methodology and Assumptions

In the 1997 Core database, there are seven characterized solid LLW/MLLW streams for ORR that have ex-situ responses. One of these streams is an asbestos stream. The radiological profile for the *Paths to Closure* ORR Asbestos Rubble/Debris (to WM) and Asbestos Rubble/Debris streams is based on the asbestos stream in the Core Database (Molten Salt Reactor Experiment D&D Asbestos-001).

To use the characterization data for this waste stream, the density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OR-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m3)	Nuclide	Average Concentration	Maximum Concentration	Unit
Molten Salt Reactor Experiment D&D	Asbestos-001	CD1	RASB	59.18	CESIUM-137	300	1000	pCi/g
Molten Salt Reactor Experiment D&D	Asbestos-001	CD1	RASB	59.18	STRONTIUM-90	300	1000	pCi/g

Oak Ridge Operations Office

Waste Stream ID/Map ID: P0156 / GAB

Stream Name: LLW Sludge/Residues/Rubble

Life-Cycle Volume: 14,407.44

Debris/Other Solids (to WM)

Waste Stream ID/Map ID: 02127 / GGG

Stream Name: On Site Commercial Treatment Residues

Life-Cycle Volume: 3,679.00

Waste Stream ID/Map ID: 02135 / GGC

Stream Name: TBD – MLLW Treatment Residues

Life-Cycle Volume: 29,009.10

Waste Stream ID/Map ID: 00160 / GAG

Stream Name: SEG Treatment Residuals

Life-Cycle Volume: 9.58

Waste Stream ID/Map ID: 00163 / GAJ

Stream Name: Metal Treatment Residuals

Life-Cycle Volume: 98.45

Waste Stream ID/Map ID: 02134 / GGA

Stream Name: TBD – Commercial Treatment Residues

Life-Cycle Volume: 55,315.40

**Table OR-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Cs-137	3.743E-05
Sr-90	3.743E-05
U-235	2.217E-06
U-234	4.958E-05
U-238	4.816E-05

Methodology and Assumptions

In the 1997 Core database, there are seven characterized solid LLW/MLLW streams for ORR that have *in situ* responses. These seven streams include three paper/cloth LLW streams, one paper/cloth MLLW stream, one LLW soil stream, one LLW sludge stream, and one LLW asbestos stream. The radiological profile for the following six *Paths to Closure* ORR LLW/MLLW streams is based on a composite of the seven solid LLW/MLLW streams in the Core database:

- 1) On Site Commercial Treatment Residues
- 2) LLW Sludge/Residues/Rubble Debris/Other Solids (to WM)
- 3) SEG Treatment Residuals
- 4) Metal Treatment Residuals
- 5) TBD - Commercial Treatment Residues
- 6) TBD - MLLW Treatment Residues

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 2) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundances (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).

Table OR-5: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
Bear Creek Valley Groundwater Remediation	Paper/Cloth-001	CD1	MLLW	22.94	URANIUM	1	0	ppb
Bear Creek Valley Tributary Interception	Paper/Cloth-001	CD1	LLW	3.82	URANIUM	1000	0	ppm
Bear Creek Valley Burial Grounds	Soil-001	CD1	LLW	152.91	URANIUM	1	0	ppm
K-25 Cooling Towers Demolition	Paper/Cloth-002	CD1	LLW	169.90	URANIUM	30	0	pCi/g
K-25 Cooling Towers Demolition	Sludge-001	CD1	LLW	385.29	URANIUM	120	0	pCi/g
ORNL Main Plant Surface Impoundments	Paper/Cloth-002	CD1	LLW	53.24	CESIUM-137	30	0	pCi/g
ORNL Main Plant Surface Impoundments	Paper/Cloth-002	CD1	LLW	53.24	STRONTIUM- 90	30	0	pCi/g
Molten Salt Reactor Experiment D&D	Asbestos-001	CD1	RASB	59.18	CESIUM-137	300	1000	pCi/g
Molten Salt Reactor Experiment D&D	Asbestos-001	CD1	RASB	59.18	STRONTIUM- 90	300	1000	pCi/g

**Table OR-6: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	7.748E-05
Cs-134	3.656E-06
Cs-137	7.576E-06
Co-60	2.655E-06
Np-237	1.132E-04
Pu-238	2.709E-06
Pu-239	4.752E-05
Tc-99	4.939E-03
Th-228	3.676E-06
Th-229	1.226E-04
Th-230	5.076E-06
U-234	2.397E-01
U-235	2.213E-01
U-236	7.188E-07
U-238	2.329E-01

Methodology and Assumptions

The 1997 Core database did not contain characterization data for Paducah LLW/MLLW streams. However, the 1996 Core database contained characterization data for twenty solid LLW/MLLW streams (all MLLW). Three of these streams are rubble/debris streams. The radiological profile for the Paducah *Paths to Closure* Suspect MLLW Rubble/Debris streams is based on a composite of the three rubble/debris streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations of gross alpha, beta, and gamma were assumed to represent other nuclides appearing elsewhere in the radionuclide concentration data (e.g., uranium, technetium, and cesium).

Table OR-7: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	ALPHA-(gross)	215.5	427	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	AMERICIUM-241	0.0225	0.026	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	BETA-(gross)	168	329	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	CESIUM-134	0.2	0.2	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	CESIUM-137	0.35	0.5	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	COBALT-60	0.2	0.3	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	NEPTUNIUM-237	0.037	0.068	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	PLUTONIUM-238	0.024	0.031	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	PLUTONIUM-239	0.0295	0.038	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	THORIUM-228	0.375	0.46	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	THORIUM-229	0.775	0.8	pCi/g

Paducah Gaseous Diffusion Plant

Waste Stream ID/Map ID: 00469 / BBV

Stream Name: Suspect MLLW Rubble/Debris

Life-Cycle Volume: 8.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	THORIUM-230	0.355	0.49	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	URANIUM	349.075	867	ug/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	URANIUM-234	117.7775	288	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	URANIUM-235	0.88	0.91	%
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	URANIUM-236	0.277	0.84	pCi/g
PAD Waste Management Storage	PA-B038	CT45	MLLW	0.7604	URANIUM-238	115.52	286	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	ALPHA-(gross)	91900.6975	199563.8	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	AMERICIUM-241	24.2475	81.66	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	BETA-(gross)	43358.945	90148.92	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	CESIUM-134	0.66	1.79	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	CESIUM-137	1.8175	5.18	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	COBALT-60	0.2125	0.42	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	GAMMA	6101.4775	14430	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	NEPTUNIUM-237	36.68975	75.66	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	PLUTONIUM-238	0.424225	0.8622	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	PLUTONIUM-239	15.3847	32.39	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	TECHNETIUM-99	1596.97	3974.4	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	THORIUM-228	0.50555	0.6958	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	THORIUM-229	37.305	75.79	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	THORIUM-230	0.687975	0.827	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	URANIUM	152632.2325	343593	PPM
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	URANIUM-234	1.9	2.1	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	URANIUM-235	0.588	0.702	wt. %
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	URANIUM-236	0.0225	0.035	pCi/g
PAD Waste Management Storage	PA-I020	CT108	MLLW	1.9016	URANIUM-238	3.2	3.6	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	ALPHA-(gross)	1.2975	4.46	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	AMERICIUM-241	0.255	0.35	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	BETA-(gross)	1.47	5.1	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	CESIUM-134	0.0975	0.14	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	CESIUM-137	0.1125	0.17	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	COBALT-60	0.1225	0.16	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	GAMMA	9.806333333	17.07	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	NEPTUNIUM-237	0.102571429	0.25	pCi/g

Paducah Gaseous Diffusion Plant

Waste Stream ID/Map ID: 00469 / BBV

Stream Name: Suspect MLLW Rubble/Debris

Life-Cycle Volume: 8.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	PLUTONIUM-238	0.096425	0.097	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	PLUTONIUM-239	0.047	0.0475	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	TECHNETIUM-99	5.59	5.59	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	THORIUM-228	0.11675	0.133	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	THORIUM-229	0.5635	0.705	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	THORIUM-230	0.177075	0.453	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	URANIUM	11.902125	32.94	ppm
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	URANIUM-234	0.311428571	1.4	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	URANIUM-235	0.477833333	0.69	wt. %
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	URANIUM-236	0.02175	0.03	pCi/g
PAD Waste Management Storage	PA-K038	CT122	MLLW	9.0042	URANIUM-238	1.006	3.9	pCi/g

Portsmouth Gaseous Diffusion Plant

Waste Stream ID/Map ID: 00486 / AAT

Stream Name: Mixed Low-Level Waste Passive Treatment Media

Life-Cycle Volume: 156.00

**Table OR-8: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Tc-99	4.979E-05
U-235	1.610E-07
U-238	6.808E-04

Methodology and Assumptions

The 1997 Core database did not contain characterization data for Portsmouth LLW/MLLW streams. However, the 1996 Core database contained characterization data for 58 solid LLW/MLLW and radioactive PCB streams, including rubble/debris, sludge, othersolids, and soil. Twelve of these streams (all either MLLW or radioactive PCBs) are sludge streams. The radiological profile for the Portsmouth *Paths to Closure* MLLW Passive Treatment Media is based on a composite of the twenty sludge streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 2) Concentrations of gross beta were assumed to represent other nuclides appearing elsewhere in the radionuclide concentration data (e.g., technetium).

Table OR-9: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Media Name	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Un
PORTS Waste Management Storage	PRT1278	Sludge	CT111	MLLW	1389.7	URANIUM-238	1765	2601	mg
PORTS Waste Management Storage	PRT1282	Sludge	CT116	MLLW	98.7	TECHNETIUM-99	795	3200	pC
PORTS Waste Management Storage	PRT1282	Sludge	CT116	MLLW	98.7	URANIUM-238	6090	16000	mg
PORTS Waste Management Storage	PRT1283	Sludge	CT117	MLLW	36	URANIUM-238	30	39	mg
PORTS Waste Management Storage	PRT1283	Sludge	CT117	MLLW	36	URANIUM-235	0.81	1.02	mg
PORTS Waste Management Storage	PRT1283	Sludge	CT117	MLLW	36	TECHNETIUM-99	230	300	pC
PORTS Waste Management Storage	PRT1284	Sludge	CT118	MLLW	571.2	URANIUM-238	296	884	mg
PORTS Waste Management Storage	PRT1284	Sludge	CT118	MLLW	571.2	TECHNETIUM-99	69900	996000	pC
PORTS Waste Management Storage	PRT1288	Sludge	CT121	MLLW	10.9	TECHNETIUM-99	691	8021	pC
PORTS Waste Management Storage	PRT1288	Sludge	CT121	MLLW	10.9	URANIUM-235	196	1107	pC
PORTS Waste Management Storage	PRT1288	Sludge	CT121	MLLW	10.9	URANIUM-238	1143	9679	pC
PORTS Waste Management Storage	PRT1294	Sludge	3T62	MLLW	13.3	URANIUM-238	103	204	mg
PORTS Waste Management Storage	PRT1294	Sludge	3T62	MLLW	13.3	TECHNETIUM-99	1212	4237	pC
PORTS Waste Management Storage	PRT1294	Sludge	3T62	MLLW	13.3	BETA-(gross)	1398	5171	pC
PORTS Waste Management Storage	PRT1295	Sludge	CT127	MLLW	3.6	URANIUM-238	103	204	mg
PORTS Waste Management Storage	PRT1295	Sludge	CT127	MLLW	3.6	TECHNETIUM-99	1212	4237	pC
PORTS Waste Management Storage	PRT1295	Sludge	CT127	MLLW	3.6	BETA-(gross)	1398	5171	pC
PORTS Waste Management Storage	PRT1296	Sludge	3T63	MLLW	2.9	URANIUM-238	103	204	mg

Portsmouth Gaseous Diffusion Plant

Waste Stream ID/Map ID: 00486 / AAT

Stream Name: Mixed Low-Level Waste Passive Treatment Media

Life-Cycle Volume: 156.00

Core Reporting Level	WS ID	Media Name	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	U
PORTS Waste Management Storage	PRT1296		3T63	MLLW	2.9	TECHNETIUM-99	1212	4237	pl
PORTS Waste Management Storage	PRT1296		3T63	MLLW	2.9	BETA-(gross)	1398	5171	pl
PORTS Waste Management Storage	PRT1297		CT128	MLLW	172.7	BETA-(gross)	1398	5171	pl
PORTS Waste Management Storage	PRT1297		CT128	MLLW	172.7	URANIUM-238	103	204	m
PORTS Waste Management Storage	PRT1297		CT128	MLLW	172.7	TECHNETIUM-99	1212	4237	pl
PORTS Waste Management Storage	PRT1298		CT129	RPCB	82.9	BETA-(gross)	1398	5171	pl
PORTS Waste Management Storage	PRT1298		CT129	RPCB	82.9	URANIUM-238	103	204	m
PORTS Waste Management Storage	PRT1298		CT129	RPCB	82.9	TECHNETIUM-99	1212	4237	pl
PORTS Waste Management Storage	PRT1299		CT130	RPCB	14	URANIUM-238	103	204	m
PORTS Waste Management Storage	PRT1299		CT130	RPCB	14	TECHNETIUM-99	1212	4237	pl
PORTS Waste Management Storage	PRT1299		CT130	RPCB	14	BETA-(gross)	1398	5171	pl
PORTS Waste Management Storage	PRT1300		CT132	RPCB	178	TECHNETIUM-99	1212	4237	pl
PORTS Waste Management Storage	PRT1300		CT132	RPCB	178	BETA-(gross)	1398	5171	p
PORTS Waste Management Storage	PRT1300		CT132	RPCB	178	URANIUM-238	103	204	m

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Oakland Operations Office

Table OK-1: Paths to Closure Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
ETEC	01669	AA	LLW	LLW-Defense D&D Waste (from ER)	2,760.00
ETEC	01671	AC	LLW	LLW-Non-defense D&D Waste (from ER)	641.00
ETEC	01673	ADA	LLW	[Stabilized] Hydraulic Oil (from ER)	0.40
ETEC	01687	BJ	MLLW	MLLW-Soil (from ER)	1,365.00
GA	01720	CAA	LLW	[Characterized & Packaged] LLW Soil (HA)	336.00
GA	01723	CBA	MLLW	[Stabilized/Deactivated] MLLW Soil (HA)	1.00
GE	01727	AB	LLW	LLW-Contaminated Rubble/Debris	20.00
LEHR	01771	AA/AB/AC (from LLW Map)	LLW	[Vol. Reduced, Compacted, Packaged] Suspect LLW-Contaminated Soil/Debris	1,986.30
LEHR	01775	AD/AE (from LLW Map)	LLW	[Stabilized & Packaged] Biological & Imhoff Sludge Waste	9.40
SPRU	01842	AB	LLW	LLW- Contaminated Rubble from Storage & Collection Building (K5/6)	20.00
SPRU	01846	AD	LLW	LLW-Contaminated Rubble from Waste Baler (L7)	10.00
SPRU	01863	BBE	LLW	[Rinsed] LLW-Pipes, Tanks & Equipment	400.00
SPRU	01867	BE	LLW	LLW-Pipes, Tanks & Equipment (not rinsed)	400.00
SPRU	01870	BH	LLW	LLW- Contaminated Building Rubble	3,900.00
SPRU	01840	AA	LLW	LLW-Contaminated Soils from Storage & Collection Building	2,200.00
SPRU	01844	AC	LLW	LLW-Contaminated Soils from Waste Baler (L7)	10.00
SPRU	01848	AE	LLW	LLW-Contaminated Soils from Lower Parking	150.00
SPRU	01850	AF	LLW	LLW-Contaminated Soils from Drum Storage	1,000.00
SPRU	01869	BG	LLW	LLW-Contaminated Soils	130.00

**Table OK-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Co-60	3.64E-05
Cs-137	7.08E-04
Sr-90	2.71E-04

Methodology and Assumptions

In the 1997 Core database, there is no characterized LLW/MLLW at ETEC. In the WM97 data call, there are 14 solid LLW/MLLW streams for ETEC. These streams include two LLW streams bound for NTS, two LLW streams bound for Hanford, three MLLW streams bound for INEL, four LLW and one MLLW streams bound for Envirocare, and two MLLW streams bound for "NR". The two NTS-bound streams are rubble/debris and sources. Since 01669 is identified in *Paths to Closure* as being bound for NTS, the *Paths to Closure* ETEC LLW-Defense D&D Waste (from ER) stream was cross-walked directly to the NTS-bound rubble/debris stream (ETEC0011).

Table OK-3: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
ETEC0011	General D&D Waste for NTS	2,652.34

**Table OK-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Co-60	7.56E-03
Cs-137	1.35E-03
Sr-90	5.29E-04

Methodology and Assumptions

In the 1997 Core database, there is no characterized LLW/MLLW at ETEC. In the WM97 data call, there are 14 solid LLW/MLLW streams for ETEC. These streams include two LLW streams bound for NTS, two LLW streams bound for Hanford, three MLLW streams bound for INEL, four LLW and one MLLW streams bound for Envirocare, and two MLLW streams bound for "NR". The two Hanford-bound streams are debris and asbestos. Since the ETEC LLW-Non-Defense D&D Waste (from ER) stream is identified in *Paths to Closure* as being bound for Hanford, the radiological profiles for this stream is based on a composite of two Hanford-bound streams (ETEC0012 and ETEC0015).

Table OK-5: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
ETEC0012	General D&D Waste for Hanford	1,911.54
ETEC0015	D&D Waste with Asbestos	9.40

**Table OK-6: Radiological Profile for
*Paths to Closure Waste Streams***

Nuclide	Ci/m ³
Cs-137	1.73E-07

Methodology and Assumptions

In the 1997 Core database, there is no characterized LLW/MLLW at ETEC. In the 1997 EM-30 Data Call, one of the 18 ETEC streams is identified as Hydraulic Oil D&D Waste (ETEC0016), which seems to be the same as the *Paths to Closure* ETEC [Stabilized] Hydraulic Oil (from ER) stream prior to stabilization.

Table OK-7: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
ETEC0016	Hydraulic Oil D&D Waste	0.11

Energy Technology Engineering Center

Waste Stream ID/Map ID: 01687 / BJ

Stream Name: MLLW-Soil (from ER)

Life-Cycle Volume: 1,365.00

Radiological Profile for *Paths to Closure Waste Streams*

Nuclide	Ci/m ³
Cs-137	4.325E-07
Sr-90	1.283E-06

Methodology and Assumptions

In the 1997 Core database, there is no characterized LLW/MLLW at ETEC. In the 1997 EM-30 Data Call, there are 9 LLW and 9 MLLW ETEC streams. None of the MLLW streams have mean standardized concentrations that could be used in this analysis. Of the LLW streams, only one is soil. The radiological profile for the *Paths to Closure* ETEC MLLW-Soil stream is based on the EM-30 LLW soil stream (ETEC0013).

Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
ETEC0013	Soil	15,702.14

General Atomics

Waste Stream ID/Map ID: 01720 / CAA

Stream Name: [Characterized & Packaged] LLW Soil (HA)

Life-Cycle Volume: 336.00

Waste Stream ID/Map ID: 01723 / CBA

Stream Name: [Stabilized/Deactivated] MLLW Soil (HA)

Life-Cycle Volume: 1.00

**Table OK-8: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	1.417E-05
Ba-137m	7.168E-02
C-14	1.771E-04
Co-60	3.555E-01
Cs-137	7.577E-02
Pu-239	2.479E-05
Pu-240	7.083E-06
Pu-241	7.083E-04
Sr-90	7.796E-02
Tc-99	3.541E-06
U-233	7.083E-06
U-234	1.062E-05
U-235	7.083E-08
Y-90	7.796E-02

Methodology and Assumptions

In the 1997 Core database, there is no characterized solid LLW/MLLW for GA. In the 1997 EM-30 data call, there are four LLW and eleven MLLW streams reported by Hanford as being received from GA. The four LLW streams have no matrix information and the eleven MLLW streams include four process residue streams, two soils streams, two debris streams and one stream each of special waste, inherently hazardous waste, and unidentified waste. Hanford also reported that two of the LLW streams will be disposed of after processing, one remote-handled and one contact-handled, and one LLW stream will be disposed of directly. The radiological profiles for the two GA LLW streams are based on a composite of the three GA LLW streams reported by Hanford (HANF1111, HANF1112, and HANF1051).

Table OK-9: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
HANF1111	GA CH Cat3 LLW Overpacked Solids in Med Boxes	116.92
HANF1112	GA RH Cat3 LLW Overpacked Solids in Drums	3.73
HANF1051	GA CH Cat1 LLW Solids in Med Boxes	617.61

General Electric

Waste Stream ID/Map ID: 01727 / AB

Stream Name: LLW-Contaminated Rubble Debris

Life-Cycle Volume: 20.00

**Table OK-10: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Ba-137m	4.699E-03
Co-60	1.409E-03
Cs-137	4.967E-03
Sr-90	7.165E-03
Y-90	7.165E-03

Methodology and Assumptions

Waste Stream ID Code 01727: Neither the 1997 Core database nor the 1997 EM-30 data call contain characterization data for General Electric LLW streams. To develop a radiological profile for GE LLW, GA LLW was used as a surrogate. In the 1997 EM-30 data call, there are four LLW and eleven MLLW streams reported by Hanford as being received from GA. The four LLW streams have no matrix information and the eleven MLLW streams include four process residue streams, two soils streams, two debris streams and one stream each of special waste, inherently hazardous waste, and unidentified waste. Hanford also reported that two of the LLW streams will be disposed of after processing, one remote-handled and one contact-handled, and one LLW stream will be disposed of directly. The radiological profile for the GW LLW-Contaminated Rubble/debris stream is based on a composite of the two LLW contact-handled streams (HANF1111 and HANF1051).

Table OK-11: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
HANF1111	GA CH Cat3 LLW Overpacked Solids in Med Boxes	116.92
HANF1051	GA CH Cat1 LLW Solids in Med Boxes	617.61

Laboratory for Energy-Related Health Research

Waste Stream ID/Map ID: 01771 / AA/AB/AC Stream Name: [Vol. Reduced, Compacted, Packaged]
(from LLW Map)

Suspect LLW-Contaminated Soil/Debris

Life-Cycle Volume: 1,986.30

**Table OK-12: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Ac-228	1.05E-06
ALPHA-(gross)	1.78E-05
BETA-(gross)	1.82E-02
Bi-212	2.09E-06
Bi-214	2.09E-06
C-14	7.01E-05
Cs-137	1.26E-05
Co-60	1.69E-06
H-3	1.36E-04
Pb-212	1.05E-06
Pb-214	1.05E-06
Pu-241	6.63E-10
K-40	1.88E-05
Ra-226	7.53E-06
Sr- 90	8.81E-03
Th-228	2.30E-06
Th-232	1.05E-06
U-235	3.14E-06

Methodology and Assumptions

In the Paths to Closure data, this waste stream is a composite of two other waste streams: 1,299 m³ of soil/sediment and 834 m³ of rubble/debris. In the 1997 Core database, there are only 5 solid LLW/MLLW streams with characterization data for LEHR: one LLW soil stream, two LLW metal streams, and one LLW rubble/debris streams. The radiological profile for the LEHR Paths to Closure Suspect LLW-Contaminated Soil/Debris stream is based on a composite of these four streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used where no average concentrations were provided in the Core database.
- 2) Data on concentrations of gross alpha and gross beta were assumed to be included in the concentrations of specific nuclides that are represented elsewhere in the data (e.g., under Ra-226 and Co-60).
- 3) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 4) Thallium was assumed to be so short-lived that it could be omitted from the profile.

Table OK-13: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	BETA-(gross)	17361	34700	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	LEAD-214	1	2	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	HYDROGEN-3	130	230	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	CARBON-14	67	117	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	STRONTIUM- 90	8350	16700	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	CESIUM-137	12	23	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	ALPHA-(gross)	17	17	pCi/g

Laboratory for Energy-Related Health Research

Waste Stream ID/Map ID: 01771 / AA/AB/AC Stream Name: [Vol. Reduced, Compacted, Packaged]
(from LLW Map)

Life-Cycle Volume: 1,986.30

Suspect LLW-Contaminated Soil/Debris

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	LEAD-212	1	1	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	THALLIUM	1	1	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	THORIUM-228	2	2	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	RADIUM-226	4	7	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	POTASSIUM-40	18	20	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	BISMUTH-212	2	2	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	COBALT-60	0.05	0.05	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	ACTINIUM-228	1	2	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	URANIUM-235	3	3	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	THORIUM-232	1	2	pCi/g
SOIL AND GROUNDWATER	Soil-01	3D1	LLW	781.00	BISMUTH-214	2	3	pCi/g
D&D	Metal-001	3D2	LLW	4.20	STRONTIUM- 90	0.005		pCi/g
D&D	Metal-002	3D3	LLW	2.00	COBALT-60		559	
D&D	Rubble/Debris-02	3D1	LLW	453.00	HYDROGEN-3	0	0.11	pCi/g
D&D	Rubble/Debris-02	3D1	LLW	453.00	RADIUM-226	0	5.04	pCi/g
D&D	Rubble/Debris-02	3D1	LLW	453.00	STRONTIUM- 90	0	106	pCi/g
D&D	Rubble/Debris-02	3D1	LLW	453.00	THORIUM-228	0	0.315	pCi/g
D&D	Rubble/Debris-02	3D1	LLW	453.00	PLUTONIUM-241	0	0.001	pCi/g

Laboratory for Energy-Related Health Research

Waste Stream ID/Map ID: 01775 / AD/AE
(from LLW Map)

Stream Name: [Stabilized & Packaged Biological &
Imhoff Sludge Waste

Life-Cycle Volume: 9.40

**Table OK-14: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Cs-137	2.76E-07
H-3	3.95E-06
Pu-241	2.25E-04
Ra-226	5.56E-06
Sr-90	3.92E-04
Th-232	4.25E-08

Methodology and Assumptions

In the WM97 data call, there are two streams for LEHR entitled "Plutonium Biowaste" and "Imhoff Sludge (Tank A)". The radiological profile for the LEHR *Paths to Closure* [Stabilized and Packaged] Biological & Imhoff Sludge stream is based on a composite of these two streams.

Table OK-15: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
LEHR0007	Plutonium Biowaste	0.68
LEHR0008	Imhoff Sludge (tank A)	3.95

Separations Process Research Unit

Waste Stream ID/Map ID: 01842 / AB	Stream Name: LLW-Contaminated Rubble from Storage & Collection Building	Life-Cycle Volume: 20.00
Waste Stream ID/Map ID: 01846 / AD	Stream Name: LLW-Contaminated Rubble from Waste Baler (L7)	Life-Cycle Volume: 10.00
Waste Stream ID/Map ID: 01863 / BBE	Stream Name: [Rinsed] LLW-Pipes, Tanks & Equipment	Life-Cycle Volume: 400.00
Waste Stream ID/Map ID: 01867 / BE	Stream Name: LLW-Pipes, Tanks & Equipment (not rinsed)	Life-Cycle Volume: 400.00
Waste Stream ID/Map ID: 01870 / BH	Stream Name: LLW-Contaminated Building Rubble	Life-Cycle Volume: 3,900.00
Waste Stream ID/Map ID: 01840 / AA	Stream Name: LLW-Contaminated Soils from Storage & Collection Building	Life-Cycle Volume: 2,200.00
Waste Stream ID/Map ID: 01844 / AC	Stream Name: LLW-Contaminated Soils from Waste Baler (L7)	Life-Cycle Volume: 10.00
Waste Stream ID/Map ID: 01848 / AE	Stream Name: LLW-Contaminated Soils from Lower Parking	Life-Cycle Volume: 150.00
Waste Stream ID/Map ID: 01850 / AF	Stream Name: LLW-Contaminated Soils from Drum Storage	Life-Cycle Volume: 1,000.00
Waste Stream ID/Map ID: 01869 / BG	Stream Name: LLW-Contaminated Soils	Life-Cycle Volume: 130.00

Methodology and Assumptions

Neither the 1997 Core database nor the 1997 EM-30 data call contained characterization data for SPRU LLW/MLLW. Because there is no reasonably complete available characterization data for LLW/MLLW at SPRU, a default radiological profile was used for this waste stream. The default radiological profile for all SPRU LLW/MLLW streams is based on a composite of all DOE LLW/MLLW to be disposed of at each DOE disposal site where there is adequate capacity to dispose of SPRU LLW/MLLW.

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Ohio Field Office

Table OH-1: Paths to Closure Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
BCL	00003	A	LLW	LLW Soils from ER	7,838.00
BCL	00007	E	LLW	LLW Bulk Construction Debris (to HANF)	1,238.00
BCL	00009	G	LLW	Compacted LLW	116.50
FEMP	00063	LLW-3	LLW	LLW Contaminated Soil	20,603.00
FEMP	00069	LLW-4B2	LLW	Treated Soil	9,800.00
FEMP	00067	LLW-7	LLW	LLW Debris	11,217.00
FEMP	00070	LLW-9	LLW	LLW Residues - Uranium	4,910.00
FEMP	00073	LLW-13	LLW	LLW Residues - Thorium	1,120.00
FEMP	00078	LLW-8B2	LLW	Treated Debris	550.00
FEMP	00072	LLW-12	LLW	LLW Residues - Uranium	7,600.00
FEMP	00074	LLW-14B	LLW	Treated Residues - Thorium	240.00
FEMP	00079	LLW-10B	LLW	Treated Silo 3 Residues	6,532.00
FEMP	00081	LLW-11B	LLW	Treated Silo 1 & 2 Residues	15,264.00
FEMP	00083	LLW-17B2	LLW	Treated Sludge	1,752.00
FEMP	01253	LLW-17A1	LLW	LLW-Contam Sludge	1,754.00
FEMP	01256	LLW-17B3	LLW	Contaminated Sludge (PCBs Extracted)	877.00
FEMP	00084	LLW-18A	LLW	LLW-Nuclear Materials Depleted	596.00
FEMP	00085	LLW-18B	LLW	LLW-Nuclear Materials Enriched	182.00
FEMP	00087	LLW-18D	LLW	LLW-Nuclear Materials Enriched (Stabilized & Blended)	594.00
MEMP	02088	LLW-5A	LLW	Packaged/Characterized LLW (to NTS)	64,177.00

Battelle Columbus Laboratory

Waste Stream ID/Map ID: 00003 / A

Stream Name: LLW Soils from ER

Life-Cycle Volume: 7,838.00

**Table OH-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	2.08E-07
Cs-137	1.70E-06
Co-60	4.72E-06
Pu-239	1.28E-07
U-238	9.44E-07

Methodology and Assumptions

In the 1997 Core database, there are ten characterized solid LLW/MLLW streams. Five of these are MLLW and RPCB. Of the five remaining characterized solids, one is soil and four are rubble/debris. The profile for the LLW Soils from ER stream is based on the LLW soil, which comes from West Jefferson. (The LLW soil in the Core database occurs at West Jefferson. ~95% of the Paths to Closure LLW Soils from ER stream occurs at West Jefferson.)

To use the characterization data for these waste streams, the density of all waste was assumed to be 1.0 metric tons/cubic meter.

Table OH-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
WEST JEFFERSON	Soil-01	CD5	LLW	7,843.76	AMERICIUM-241	0.13	2.91	pCi/g
WEST JEFFERSON	Soil-01	CD5	LLW	7,843.76	URANIUM-238	0.59	8.16	pCi/g
WEST JEFFERSON	Soil-01	CD5	LLW	7,843.76	COBALT-60	2.95	4.8	pCi/g
WEST JEFFERSON	Soil-01	CD5	LLW	7,843.76	PLUTONIUM-239	0.08	3.55	pCi/g
WEST JEFFERSON	Soil-01	CD5	LLW	7,843.76	CESIUM-137	1.06	108.93	pCi/g

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Waste Stream ID/Map ID: 00007 / E
Waste Stream ID/Map ID: 00009 / G

Stream Name: LLW Bulk Construction Debris (to HANF)
Stream Name: Compacted LLW

Life-Cycle Volume: 1,238.00
Life-Cycle Volume: 116.50

**Table OH-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	1.45E-06
Cs-137	1.35E-05
Co-60	4.21E-05
Eu-152	2.58E-05
Eu-154	7.65E-06
Pu-241	5.51E-10
Pm-147	2.76E-11
Sr-90	2.07E-10
Th-232	1.83E-04
U-238	8.34E-04

Methodology and Assumptions

In the 1997 Core database, there are ten characterized solid LLW/MLLW streams. Five of these are MLLW and RPCB. Of the five remaining characterized solids, one is soil and four are rubble/debris. The profile for the LLW Bulk Construction Debris (to HANF) stream is based on a composite of the four LLW rubble/debris streams.

To use the characterization data for these waste streams, the density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OH-5: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
KING AVENUE	Rubble/Debris-01	CD3	LLW	356.83	THORIUM-232	0.00083	1.023	pCi/g
KING AVENUE	Rubble/Debris-01	CD3	LLW	356.83	COBALT-60	0.00001	0.0125	pCi/g
KING AVENUE	Rubble/Debris-01	CD3	LLW	356.83	CESIUM-137	0.00006	0.0753	pCi/g
KING AVENUE	Rubble/Debris-01	CD3	LLW	356.83	URANIUM-238	0.00009	0.112	pCi/g
KING AVENUE	Rubble/Debris-02	CD4	LLW	119.79	COBALT-60	730	1460	pCi/g
KING AVENUE	Rubble/Debris-02	CD4	LLW	119.79	CESIUM-137	215.025	430	pCi/g
KING AVENUE	Rubble/Debris-02	CD4	LLW	119.79	URANIUM-238	14950.453	30350	pCi/g
KING AVENUE	Rubble/Debris-02	CD4	LLW	119.79	THORIUM-232	3285	6570	pCi/g
WEST JEFFERSON	Rubble/Debris-02	CD9	LLW	1,478.64	COBALT-60	1.95	54.8	pCi/g
WEST JEFFERSON	Rubble/Debris-02	CD9	LLW	1,478.64	CESIUM-137	2.18	385	pCi/g
WEST JEFFERSON	Rubble/Debris-02	CD9	LLW	1,478.64	EUROPIUM-154	11.1	22.2	pCi/g
WEST JEFFERSON	Rubble/Debris-02	CD9	LLW	1,478.64	AMERICIUM-241	2.1	10.3	pCi/g
WEST JEFFERSON	Rubble/Debris-02	CD9	LLW	1,478.64	EUROPIUM-152	37.4	74.8	pCi/g
WEST JEFFERSON	Rubble/Debris-03	CD10	LLW	1,478.64	COBALT-60	0.0004	2.475	pCi/g
WEST JEFFERSON	Rubble/Debris-03	CD10	LLW	1,478.64	CESIUM-137	0.0004	21.5	pCi/g

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00063 / LLW-3
Waste Stream ID/Map ID: 00069 / LLW-4B2

Stream Name: LLW Contaminated Soil
Stream Name: Treated Soil

Life-Cycle Volume: 20,603.00
Life-Cycle Volume: 9,800.00

**Table OH-6: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	CI/m ³
Tc-99	2.98E-04
U-234	5.88E-03
U-235	2.63E-04
U-238	5.71E-03

Methodology and Assumptions

These waste streams are linked to the Soils PBS (OH-FN-06) in *Paths to Closure*, which covers OU2 and OU5 at FEMP. In the 1997 Core database within the OU2 and OU5 Core Reporting Levels, there are three soil streams. In the Rev. I of the report, OU5 Soil-02 was used as a crosswalk for waste bound for EM-30, so the radiological profiles for the *Paths to Closure* FEMP soil streams are based on the OU5 Soil-02 stream.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OH-7: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 5	Soil-02	CD10	LLW	19,114.00	TECHNETIUM-99	186	602	pCi/g
OU 5	Soil-02	CD10	LLW	19,114.00	URANIUM	10,689	90,350	mg/kg

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00067 / LLW-7
Waste Stream ID/Map ID: 00070 / LLW-9
Waste Stream ID/Map ID: 00073 / LLW-13
Waste Stream ID/Map ID: 00078 / LLW-8B2

Stream Name: LLW Debris
Stream Name: LLW Residues – Uranium
Stream Name: LLW Residues – Thorium
Stream Name: Treated Debris

Life-Cycle Volume: 11,217.00
Life-Cycle Volume: 4910.00
Life-Cycle Volume: 1,120.00
Life-Cycle Volume: 550.00

**Table OH-8: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Tc-99	4.94E-04
U-234	5.07E-02
U-235	2.27E-03
U-238	4.93E-02

Methodology and Assumptions

These waste streams are linked to the Facility D&D PBS (OH-FN-02) in *Paths to Closure*, which corresponds to OU3 at FEMP. In the 1997 Core database within the OU3 Core Reporting Level, there are two streams, both rubble/debris. In Rev. 1 of the report, OU3 Rubble/Debris-02 was used as a crosswalk for waste bound for EM30, so the radiological profiles for these streams are based on the OU3 Rubble/Debris-02 stream.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OH-9: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 3	Rubble/Debris-02	CD2	LLW	20,727	TECHNETIUM-99	309	8,100	pCi/g
OU 3	Rubble/Debris-02	CD2	LLW	20,727	URANIUM	92,300	430,000	mg/kg

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00072 / LLW-12
Waste Stream ID/Map ID: 00074 / LLW-14B

Stream Name: LLW Residues – Uranium
Stream Name: Treated Residues – Thorium

Life-Cycle Volume: 7,600.00
Life-Cycle Volume: 240.00

**Table OH-10: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Tc-99	2.07E-05
Th-232	7.91E-03
U-235	6.20E-05
U-234	5.77E-03
U-238	1.17E-02

Methodology and Assumptions

These waste streams are linked to the Aquifer Restoration PBS (OH-FN-04) and Mixed Waste PBS (OH-FN-10) in *Paths to Closure*. There is no apparent corresponding Core Reporting Level in the 199 Core database. To develop a radiological profile for this waste stream, a composite was made of all solid LLW & MLLW at FEMP, excluding wastes from the Silos (OU4) which were judged to be distinct. The composite was made of 16 streams from five Core Reporting Levels: OUI (4 streams), OU2 (6), OU3 (2), OU5 (2), & WasteMgmt (2).

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum reported concentration levels were used in place of average concentrations in those places where no average values were provided in the database.
- 2) Uranium was assumed to be a composite of U-234, U-235, and U-238 in their natural isotopic abundance (U-234: 0.0055%; U-235: 0.711%; U-238: 99.28%).
- 3) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OH-11: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 1	Rubble/Debris-01	CD2	LLW	1,529	URANIUM-238		346	pCi/g
OU 1	Sludge-01	CT1	LLW	361,938	URANIUM-238		42000	pCi/g
OU 1	Sludge-01	CT1	LLW	361,938	Th232		12000	pCi/g
OU 1	Sludge-01	CT1	LLW	361,938	URANIUM-234		18000	pCi/g
OU 1	Soil-01	CT3	LLW	100,768	URANIUM-238		346	pCi/g
OU 1	Soil-02	CT5	LLW	118,352	URANIUM-238	56	1500	pCi/g
OU 2	Asphalt-01	CD1	LLW	83,107	URANIUM-238		346	pCi/g
OU 2	Rubble/Debris-01	CD3	LLW	93,887	URANIUM-238		346	pCi/g
OU 2	Rubble/Debris-02	CD6	LLW	2,370	URANIUM-238		346	pCi/g
OU 2	Sludge-01	CD7	LLW	12,615	URANIUM-238		346	pCi/g
OU 2	Soil-01	CD5	LLW	50,613	URANIUM-238		346	pCi/g
OU 2	Soil-02	CT1	MLLW	229	URANIUM-238		346	pCi/g
OU 3	Rubble/Debris-01	CD1	LLW	186,545	URANIUM-234	160	13900	mg/kg
				186,545	U235	160		
				186,545	URANIUM-238	160		

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00072 / LLW-12
Waste Stream ID/Map ID: 00074 / LLW-14B

Stream Name: LLW Residues – Uranium
Stream Name: Treated Residues – Thorium

Life-Cycle Volume: 7,600.00
Life-Cycle Volume: 240.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 3	Rubble/Debris-01	CD1	LLW	186,545	TECHNETIUM-99	2.9	838	pCi/g
OU 3	Rubble/Debris-02	CD2	LLW	20,727	URANIUM-234	92300	430000	mg/kg
				20,727	U235	92300		
				20,727	URANIUM-238	92300		
OU 3	Rubble/Debris-02	CD2	LLW	20,727	TECHNETIUM-99	309	8100	pCi/g
OU 5	Soil-01	CD9	LLW	1,187,805	TECHNETIUM-99	17	29.1	pCi/g
OU 5	Soil-01	CD9	LLW	1,187,805	URANIUM-234	100	1030	mg/kg
				1,187,805	U235	100		
				1,187,805	URANIUM-238	100		
OU 5	Soil-02	CD10	LLW	19,114	URANIUM-234	10689	90350	mg/kg
				19,114	U235	10689		
				19,114	URANIUM-238	10689		
OU 5	Soil-02	CD10	LLW	19,114	TECHNETIUM-99	186	602	pCi/g
WASTE MANAGEMENT	OtherSolid-01	CD1	LLW	135,631	Th232	54600	109100	pCi/g
WASTE MANAGEMENT	OtherSolid-01	CD1	LLW	135,631	URANIUM-234	19000	38000	pCi/g
				135,631	U235	19000		
				135,631	URANIUM-238	19000		
WASTE MANAGEMENT	OtherSolid-03	CT2	MLLW	510	URANIUM-234		2000	pCi/g
				510	U235		2000	
				510	URANIUM-238		2000	

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00079 / LLW-10B

Stream Name: Treated Silo 3 Residues

Life-Cycle Volume: 6,532.00

**Table OH-12: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Ac-227	8.27E-04
Pb-210	3.55E-03
Pa-231	6.58E-04
Ra-226	4.03E-03
Ra-228	3.58E-04
Ra-224	3.98E-04
Th-228	7.96E-04
Th-230	6.94E-02
Th-232	8.88E-04
U-234	2.01E-03
U-235/236	1.27E-04
U-238	2.04E-03

Methodology and Assumptions

The radiological profile for the Treated Silo 3 Residues waste stream is based on mean inventories of nuclides as reported in Feasibility Study Report for Operable Unit 4, U.S. Department of Energy Fernald Site Office (DOE/EIS-0195D), February 1994, Volume 2 of 4, page A-18. The profile was calculated by dividing the numbers of curies in the reference by the volume of this waste stream as cited in the *Paths to Closure* database.

Table OH-13: Raw Data Used to Develop Radiological Profile (from "Feasibility Study Report for Operable Unit 4" issued by Fernald Environmental Management Project, Fernald, Ohio, February 1994)

Silo 3	
Nuclide	Mean Inventory (Ci)
Actinium-227	5.4
Protactinium-231	4.3
Lead-210	23.2
Radium-224	2.6
Radium-226	26.3
Radium-228	2.6
Thorium-228	5.2
Thorium-230	456
Thorium-232	5.8
Uranium-234	13.1
Uranium-235/236	0.83
Uranium-238	13.3
Total Uranium	39.9

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00081 / LLW-11B

Stream Name: Treated Silo 1 & 2 Residues

Life-Cycle Volume: 15,264.00

**Table OH-14: Radiological Profile for
Paths to Closure Waste Stream**

Nuclide	Ci/m ³
Ac-227	4.59E-03
Pb-210	1.28E-01
Po-210	1.60E-01
Pa-231	9.17E-04
Ra-226	2.47E-01
Th-228	4.32E-04
Th-230	4.48E-02
Th-232	3.41E-04
U-234	7.21E-04
U-235/236	4.52E-05
U-238	6.29E-04

Methodology and Assumptions

The radiological profile for this waste stream is based on mean inventories of nuclides as reported in Feasibility Study Report for Operable Unit 4, U.S. Department of Energy Fernald Site Office (DOE/EIS-0195D), February 1994, Volume 2 of 4, page A-3. The profile was calculated by dividing the numbers of curies in the reference by the volume of this waste stream as cited in the *Paths to Closure* database.

Table OH-15: Raw Data Used to Develop Radiological Profile (from "Feasibility Study Report for Operable Unit 4" issued by Fernald Environmental Management Project, Fernald, Ohio, February 1994

Nuclide	Silo 1	Silo 2
	Mean Inventory (Ci)	Mean Inventory (Ci)
Actinium-227	40	30
Lead-210	1110	844
Polonium-210	1630	809
Protactinium-231	ND	14
Radium-226	2630	1140
Thorium-228	2.8	3.8
Thorium-230	403	282
Thorium-232	2.9	2.3
Uranium-234	5.4	5.6
Uranium-235/236	0.28	0.43
Uranium-238	4.3	5.3
Total Uranium	12.9	15.9

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00083 / LLW-17B2 Stream Name: Treated Sludge
Waste Stream ID/Map ID: 01253 / LLW-17A1 Stream Name: LLW-Contam Sludge
Waste Stream ID/Map ID: 01256 / LLW-17B3 Stream Name: Contaminated Sludge (PCBs Extracted)

Life-Cycle Volume: 1,752.00
Life-Cycle Volume: 1,754.00
Life-Cycle Volume: 877.00

**Table OH-16: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Th-232	1.92E-02
U-234	2.88E-02
U-238	6.72E-02

Methodology and Assumptions

These waste streams are linked to the Waste Pits Remediation Project PBS (OH-FN-05) in *Paths to Closure* which corresponds to OUI at FEMP. In the 1997 Core Database within the OUI Core Reporting Level, there are four solid LLW/MLLW streams, all LLW and one of which is sludge. The radiological profile for these waste streams is based on the sludge stream in the Core database.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum reported concentration levels were used in place of average concentrations because no average values were provided for these waste streams in the Core database.
- 2) Thorium was assumed to be Th-232.
- 3) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OH-17: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU 1	Sludge-01	CT1	LLW	361,938	U-234		18,000	pCi/g
OU 1	Sludge-01	CT1	LLW	361,938	Thorium		12,000	pCi/g
OU 1	Sludge-01	CT1	LLW	361,938	U-238		42,000	pCi/g

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00084 / LLW-18A

Stream Name: LLW-Nuclear Materials Depleted

Life-Cycle Volume: 596.00

**Table OH-18: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
U-235	5.40E-03
U-234	1.56E-01
U-238	3.35E-01

Methodology and Assumptions

This stream did not crosswalk to any streams in the 1997 EM-30 data call or the 1997 Core database, so the radiological profile for this stream is based on the following independent simplifying assumptions:

- 1) The stream is composed of OU3, with U235 & U234 depleted to 0.25% and 0.0025%, respectively.
- 2) The density of the waste was assumed to be 7.0 metric tons/cubic meter (roughly 80% of OU3 actual density).

Radiological Profile Developed Using Independent Assumptions. No Raw Data Used.

Fernald Environmental Management Project

Waste Stream ID/Map ID: 00085 / LLW-18B

Stream Name: LLW-Nuclear Materials Enriched

Life-Cycle Volume: 182.00

Waste Stream ID/Map ID: 00087 / LLW-18D

Stream Name: Nuclear Materials Enriched (Stabilized & Blended)

Life-Cycle Volume: 594.00

**Table OH-19: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
U-235	4.32E-02
U-234	6.25E-01
U-238	3.29E-01

Methodology and Assumptions

These two streams did not crosswalk to any streams in the 1997 EM-30 data call or the 1997 Core database, so the radiological profile for this stream is based on the following independent simplifying assumptions:

- 1) The stream is composed of OU3, with U235 & U234 levels enriched to 2.0% and 0.01%, respectively.
- 2) The density of the waste was assumed to be 7.0 metric tons/cubic meter (roughly 80% of OU3 actual density).

Radiological Profile Developed Using Independent Assumptions. No Raw Data Used.

Miamisburg Environmental Management Project

Waste Stream ID/Map ID: 02088 / LLW-5a

Stream Name: Packaged/Characterized LLW (to NTS)

Life-Cycle Volume: 64,177.00

**Table OH-20: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	5.091E-08
Co-60	3.494E-08
Pu-238	3.373E-04
Sr- 90	4.203E-07
Th-228	4.784E-06
Th-230	4.892E-08
Th-232	8.383E-07
U-234	1.008E-07
U-235	9.983E-09
U-238	1.098E-07

Methodology and Assumptions

In the Paths to Closure data, this waste stream is a composite of the following 11 other streams at Miamisburg:

- 1) Main Hill Rad Facilities Soils
- 2) Main Hill Tritium Debris
- 3) Legacy Soil Boxes
- 4) Legacy Lab Trash
- 5) Main Hill Rad Facilities Debris
- 6) SM/PP Hill Facilities Soils
- 7) SM/PP Hill Facilities Debris
- 8) Test Fire Facilities Soils
- 9) Test Fire Facilities Debris
- 10) Soils Project Soils
- 11) Sewage Plant Sludge Disposal

In the 1997 Core database, there are five solid LLW/MLLW streams with radiological characteristic data, including four soil streams and one metal stream. The radiological profile for the Miamisburg *Paths to Closure* Packaged/Characterized LLW (to NTS) stream is based on a composite of these five streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used where no average concentrations were provided in the Core database.
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.

Table OH-21: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU4 MIAMI-ERIE CANAL	Soil-01	3D1	LLW	13,382.00	PLUTONIUM-238	530	4500	pCi/g
OU5 RAD. CONTAMINATED SOILS	Soil-01	3D1	LLW	57,994.00	PLUTONIUM-238	145	190	pCi/g
OU5 RAD. CONTAMINATED SOILS	Soil-01	3D1	LLW	57,994.00	THORIUM-228	5	313	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	URANIUM-234		1.01	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	COBALT-60		0.34999	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	STRONTIUM- 90		4.21	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	THORIUM-228		1.11	pCi/g

Miamisburg Environmental Management Project

Waste Stream ID/Map ID: 02088 / LLW-5a

Stream Name: Packaged/Characterized LLW (to NTS)

Life-Cycle Volume: 64,177.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	THORIUM-230		0.49	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	URANIUM-238		1.1	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	URANIUM-235		0.1	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	THORIUM-232		1.39	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Metal-01	3D1	LLW	100.00	AMERICIUM-241		0.50999	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	THORIUM-230		0.49	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	STRONTIUM- 90		4.21	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	AMERICIUM-241		0.50999	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	THORIUM-228		1.11	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	THORIUM-232		1.39	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	URANIUM-234		1.01	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	URANIUM-235		0.1	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	URANIUM-238		1.1	pCi/g
UNDERGROUND LINES TO WASTE DISPOSAL	Soil-01	3D2	LLW	6,094.00	COBALT-60		0.34999	pCi/g
DECOMMISSIONING OF EW SOIL	Soil-01	3D1	LLW	21,702.00	THORIUM-232	2	5	pCi/g
DECOMMISSIONING OF EW SOIL	Soil-01	3D1	LLW	21,702.00	PLUTONIUM-238	250	500	pCi/g

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Rocky Flats Field Office

Table RF-1: *Paths to Closure* Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m³)
RFTS	01384	ER-03B	LLW	Soil to LL	21,525.00
RFTS	01374	ER-01A	LLW	LL ER Debris	230.40
RFTS	01386	ER-04A	LLW	Sorted D&D LLW	23,062.00
RFTS	PT003	M-01A-ER (from MLLW Map)	MLLW	Sorted Routine Ops/Deact Solids to Disposal (ER Portion)	30,391.25
RFTS	PT007	M-01BA-ER (from MLLW Map)	MLLW	Treated Routine Ops/Deact Solids to Disposal (ER Portion)	30,391.25

**Table RF-2: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	5.017E-04
Cs-137	9.008E-08
H-3	1.309E-04
Pu-239	1.227E-05
Pu-240	1.227E-05
Ra-226	3.260E-09
Sr- 90	2.508E-10
U-233	1.673E-06
U-234	4.259E-03
U-235	5.015E-10
U-238	1.415E-06

Methodology and Assumptions

In the 1997 Core database, there are seven characterized solid LLW/MLLW streams at RFETS, all with ex-situ responses, including five MLLW soil streams, one LLW soil stream, and one MLLW sludge stream. The radiological profile for the Soil to LL stream is based on a composite of the six soil streams.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations of gross alpha, beta, and gamma were assumed to represent other nuclides appearing elsewhere in the radionuclide concentration data (e.g., uranium, technetium, americium).
- 4) Americium was assumed to be Am-241.
- 5) Plutonium was assumed to be Pu-239

Table RF-3: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU2, 903 PAD, MOUND, EAST TRENCH	Soil-01	CS1	MLLW	12,660.00	AMERICIUM	0	2273	pCi/g
OU2, 903 PAD, MOUND, EAST TRENCH	Soil-01	CS1	MLLW	12,660.00	GAMMA	0	55000	pCi/g
OU2, 903 PAD, MOUND, EAST TRENCH	Soil-01	CS1	MLLW	12,660.00	PLUTONIUM	0	20455	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	BETA-(gross)	0	32	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	PLUTONIUM-239	0	0.17	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	RADIUM-226	0	1.3	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	STRONTIUM- 90	0	0.1	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	URANIUM-235	0	0.2	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	URANIUM-238	0	1.7	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	HYDROGEN-3	0	12000	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	ALPHA-(gross)	0	37	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	152.92	URANIUM	0	3.7	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	ALPHA-(gross)	0	42	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	AMERICIUM-241	0	0.03999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	BETA-(gross)	0	36	pCi/g

Rocky Flats Environmental Technology Site

Waste Stream ID/Map ID: 01384 / ER-03B

Stream Name: Soil to LL

Life-Cycle Volume: 21,525.00

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	HYDROGEN-3	0	0.21999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	PLUTONIUM-239	0	0.07	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	PLUTONIUM-240	0	0.07	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	URANIUM-233	0	0.87	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	URANIUM-234	0	0.87	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512.00	URANIUM-238	0	0.83999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	ALPHA-(gross)	0	53	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	AMERICIUM-241	0	24	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	BETA-(gross)	0	1100	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	HYDROGEN-3	0	0.23999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	PLUTONIUM-239	0	8.1	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	PLUTONIUM-240	0	8.1	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	URANIUM-233	0	1.3	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	URANIUM-234	0	1.3	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751.00	URANIUM-238	0	1.1	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	ALPHA-(gross)	0	24.2	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	BETA-(gross)	0	42.2	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	HYDROGEN-3	0	3260	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	PLUTONIUM-239	0	15.86	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	PLUTONIUM-240	0	15.86	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	URANIUM-233	0	1.66	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	URANIUM-234	0	1.66	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873.00	URANIUM-238	0	1.2	pCi/g
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618.00	HYDROGEN-3	0	3260	pCi/L
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618.00	CESIUM-137	0	0.82999	pCi/g
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618.00	PLUTONIUM-240	0	15.86	pCi/g
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618.00	PLUTONIUM-239	0	15.86	pCi/g

Waste Stream ID/Map ID: 01374 / ER-01A
Waste Stream ID/Map ID: 01386 / ER-04A

Rocky Flats Environmental Technology Site

Stream Name: LL ER Debris
Stream Name: Sorted D&D LLW

Life-Cycle Volume: 230.40
Life-Cycle Volume: 23,062.00

**Table RF-4: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Pu-239	3.92E-03

Methodology and Assumptions

In the 1997 Core database, there are seven characterized solid LLW/MLLW streams at RFETS, all with ex-situ responses, including five MLLW soil streams, one LLW soil stream, and one MLLW sludge stream. No profile was developed based on Core data because none of the matrices was identified as debris.

In the 1997 EM-30 Data Call, there are 36 solid LLW/MLLW streams at RFETS. Eleven are LLW, nine of which are shipped to NTS, and two of which are shipped to Envirocare. Twenty-five are MLLW, eight of which are treated onsite and then shipped to Envirocare, and the remaining seventeen of which are shipped to either Envirocare, SEG, or ORR. Of the nine LLW streams being sent to NTS, five are debris and four are process residues. Since the *Paths to Closure* data indicates that the LL ER Debris and Sorted D&D LLW streams will likely go to NTS for disposal, the radiological profile for these streams is based on a composite of the five RFETS LLW streams in the 1997 EM-30 Data Call that are being shipped to NTS.

Table RF-5: Raw Data Used to Develop Radiological Profile (from 1997 Waste Management Data Call)

Waste Management ID	Stream Name	Volume (m ³)
RFTS0047	Mixed IDCs Combustible/LLW	5,125.72
RFTS0049	Compactible Debris/LLW	68.51
RFTS0050	Composite Filter Debris/LLW	8,549.36
RFTS0065	Metal Debris/LLW	9,176.25
RFTS0066	Combustibles/LLW	15,435.70

Rocky Flats Environmental Technology Site

Waste Stream ID/Map ID: PT003 / M-01A-ER Stream Name: Sorted Routine Ops/Deact Solids
(from MLLW Map) to Disposal (ER Portion)

Life-Cycle Volume: 30,391.25

Waste Stream ID/Map ID: PT007 / M-01BA-ER Stream Name: Treated Routine Ops/Deact Solids
(from MLLW Map) to Disposal (ER Portion)

Life-Cycle Volume: 30,391.25

**Table RF-6: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Am-241	1.048E-03
Cs-137	8.263E-08
H-3	1.709E-03
Pu-239	4.396E-03
Pu-240	1.126E-05
Ra-226	2.990E-09
Sr-90	2.300E-10
U-233	1.535E-06
U-234	7.699E-05
U-235	3.707E-06
U-238	6.484E-05

Methodology and Assumptions

In the 1997 Core database, there are seven characterized solid LLW/MLLW streams at RFETS, all with ex-situ responses, including five MLLW soil streams, one LLW soil stream, and one MLLW sludge stream. The radiological profile for the Sorted and Treated Routine Ops/Deact Solids to Disposal (ER Portion) MLLW streams is based on a composite of all seven streams in the Core database.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used (no average concentrations were in the Core database).
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations of gross alpha, beta, and gamma were assumed to represent other nuclides appearing elsewhere in the radionuclide concentration data (e.g., uranium, technetium, americium).
- 4) Americium was assumed to be Am-241.
- 5) Plutonium was assumed to be Pu-239.

Table RF-7: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU2, 903 PAD, MOUND, EAST TRENCH	Soil-01	CS1	MLLW	12,660	AMERICIUM	0	2273	pCi/g
OU2, 903 PAD, MOUND, EAST TRENCH	Soil-01	CS1	MLLW	12,660	GAMMA	0	55000	pCi/g
OU2, 903 PAD, MOUND, EAST TRENCH	Soil-01	CS1	MLLW	12,660	PLUTONIUM	0	20455	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	ALPHA-(gross)	0	150	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	AMERICIUM-241	0	4440	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	HYDROGEN-3	0	12000	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	PLUTONIUM-239	0	3700	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	URANIUM-234	0	570	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	URANIUM-235	0	28	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	BETA-(gross)	0	530	pCi/g
OU4, SOLAR PONDS	Sludge-01	CT2	MLLW	8,800	URANIUM-238	0	480	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	URANIUM-238	0	17	pCi/g

Rocky Flats Environmental Technology Site

Waste Stream ID/Map ID: PT003 / M-01A-ER Stream Name: Sorted Routine Ops/Deact Solids
(from MLLW Map) to Disposal (ER Portion)

Life-Cycle Volume: 30,391.25

Waste Stream ID/Map ID: PT007 / M-01BA-ER Stream Name: Treated Routine Ops/Deact Solids
(from MLLW Map) to Disposal (ER Portion)

Life-Cycle Volume: 30,391.25

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	PLUTONIUM-239	0	0.17	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	URANIUM	0	3.7	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	ALPHA-(gross)	0	37	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	BETA-(gross)	0	32	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	RADIUM-226	0	1.3	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	URANIUM-235	0	0.2	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	STRONTIUM- 90	0	0.1	pCi/g
OU4, SOLAR PONDS	Soil-01	CD1	MLLW	153	HYDROGEN-3	0	12000	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	AMERICIUM-241	0	0.03999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	ALPHA-(gross)	0	42	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	BETA-(gross)	0	36	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	HYDROGEN-3	0	0.21999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	URANIUM-238	0	0.83999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	URANIUM-234	0	0.87	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	URANIUM-233	0	0.87	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	PLUTONIUM-240	0	0.07	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-01	CD1	MLLW	512	PLUTONIUM-239	0	0.07	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	PLUTONIUM-240	0	8.1	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	URANIUM-238	0	1.1	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	URANIUM-234	0	1.3	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	HYDROGEN-3	0	0.23999	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	PLUTONIUM-239	0	8.1	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	BETA-(gross)	0	1100	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	AMERICIUM-241	0	24	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	ALPHA-(gross)	0	53	pCi/g
OU10, OTHER OUTSIDE CLOSURES	Soil-03	CT2	LLW	75,751	URANIUM-233	0	1.3	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	HYDROGEN-3	0	3260	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	PLUTONIUM-240	0	15.86	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	BETA-(gross)	0	42.2	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	ALPHA-(gross)	0	24.2	pCi/g

Rocky Flats Environmental Technology Site

Waste Stream ID/Map ID: PT003 / M-01A-ER Stream Name: Sorted Routine Ops/Deact Solids
(from MLLW Map) to Disposal (ER Portion)

Life-Cycle Volume: 30,391.25

Waste Stream ID/Map ID: PT007 / M-01BA-ER Stream Name: Treated Routine Ops/Deact Solids
(from MLLW Map) to Disposal (ER Portion)

Life-Cycle Volume: 30,391.25

Core Reporting Level	WS ID	Response	Waste Type	Volume (m ³)	Nuclide	Average Concentration	Maximum Concentration	Units
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	PLUTONIUM-239	0	15.86	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	URANIUM-238	0	1.2	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	URANIUM-233	0	1.66	pCi/g
OU12, 400/800 AREA	Soil-01	CS1	MLLW	1,873	URANIUM-234	0	1.66	pCi/g
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	STRONTIUM-89	0	0	
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	CESIUM-137	0	0.82999	pCi/g
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	HYDROGEN-3	0	3260	pCi/L
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	URANIUM-235	0	0	
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	STRONTIUM- 90	0	0	
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	RADIUM-226	0	0	
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	PLUTONIUM-240	0	15.86	pCi/g
OU13, 100 AREA	Soil-01	CT1	MLLW	6,618	PLUTONIUM-239	0	15.86	pCi/g

DNFSB 94-2 Low-Level Waste Disposal Capacity Report
Methodology Used to Estimate Radionuclide Profiles of Environmental Restoration Wastes from
Savannah River Operations Office

Table SR-1: *Paths to Closure* Environmental Restoration Waste Streams

Site ID	Waste Stream ID Code	ER Map ID	Waste Type	Stream Name	Life-Cycle Volume (m ³)
SRS	02202 (low I-129)	BF	LLW	LLW Sludge (2 nd waste from AI)	1,838.25
SRS	02202 (high I-129)	BF	LLW	LLW Sludge (2 nd waste from AI)	1,838.25
SRS	02184	AA	LLW	LLW Soil, Rubble, Debris (Dispose)	41,791.04
SRS	02185	AB	LLW	LLW Vegetation	344.50

Savannah River Site

Waste Stream ID/Map ID: 02202 / BF (low I-129) Stream Name: LLW Sludge (2nd waste from AI)

Life-Cycle Volume: 1,838.25

Table SR-2: Radiological Profile for Paths to Closure Waste Streams

Nuclide	Ci/m ³
Pu-238	9.565E-13
Pu-239	2.521E-12
Pu-240	5.932E-13
U-233	0.000E+00
U-234	1.332E-08
U-235	1.567E-09
U-238	2.437E-08
Th-234	2.437E-08
Pa-234m	2.437E-08
Am-241	2.257E-09
Cm-244	3.757E-09
Np-237	2.056E-11
Pu-241	4.820E-11
Pu-242	5.166E-13
Ac-228	2.118E-09
Cf-249	1.656E-11
Cs-137	2.793E-10
Co-60	1.275E-10
Sr-90	1.367E-08
Y-90	1.367E-08
H-3	1.226E-07
C-14	4.672E-10
I-129	1.342E-11
Tc-99	1.063E-10

Methodology and Assumptions

The first attempt to develop a radiological profile for the Paths to Closure SRS LLW Sludge (2nd waste from AI) waste stream was based on a composite of the four "othersolid" LLW/MLLW streams identified for SRS in the 1997 Core database. However, the result produced a profile containing levels of I-129 too high to be accepted at the SRS Slit Trench disposal facility. The second attempt to develop a radiological profile for this waste stream is based on two SRS EAV/CIF LLW Characterization Forms for the two Waste Streams that make up the Paths to Closure stream LLW Sludge (2nd waste from AI). The two SRS streams are sludges from the F Area and H Area groundwater treatment facilities, identified as FAGW-0001-LLW and HAGW-0001-LLW. The H Area stream contains higher levels of I-129 than the F Area stream. For this analysis, it was assumed that each SRS stream corresponded to one-half of the volume of the Paths to Closure stream. The radiological profile for the stream with lower levels of I-129 is based on the SRS EAV/CIF LLW Characterization Form for FAGW-0001-LLW.

Table SR-3: Raw Data Used to Develop Radiological Profile (Based on data from SRS EAV/CIF LLW Characterization Form for Waste Stream FAGW-0001-LLW)

Curies	ft ³	Nuclide	% of Total
3.50E-05	5000	Pu-238	3.870E-04
		Pu-239	1.020E-03

Savannah River Site

Waste Stream ID/Map ID: 02202 / BF (low I-129). Stream Name: LLW Sludge (2nd waste from AI)

Life-Cycle Volume: 1,838.25

Curies	ft ³	Nuclide	% of Total
		Pu-240	2.400E-04
		U-233	0.000E+00
		U-234	5.390E+00
		U-235	6.340E-01
		U-238	9.860E+00
		Th-234	9.860E+00
		Pa-234m	9.860E+00
		Am-241	9.130E-01
		Cm-244	1.520E+00
		Np-237	8.320E-03
		Pu-241	1.950E-02
		Pu-242	2.090E-04
		Ac-228	8.570E-01
		Cl-249	6.700E-03
		Cs-137	1.130E-01
		Co-60	5.160E-02
		Sr-90	5.530E+00
		Y-90	5.530E+00
		H-3	4.960E+01
		C-14	1.890E-01
		I-129	5.430E-03
		Tc-99	4.300E-02

Savannah River Site

Waste Stream ID/Map ID: 02202 / BF (high I-129) Stream Name: LLW Sludge (2nd waste from AI)

Life-Cycle Volume: 1,838.25

Table SR-4: Radiological Profile for Paths to Closure Waste Streams

Nuclide	Ci/m ³
Sr-90	7.232E-04
Y-90	7.232E-04
H-3	1.237E-04
Co-60	3.792E-05
C-14	6.496E-06
Np-237	4.032E-06
U-238	2.976E-06
U-234	2.504E-06
U-233	4.080E-07
Tc-99	3.616E-07
Cs-137	3.632E-08
Ba-137m	3.440E-08
I-129	1.318E-08
Pu-239	1.162E-08
Pu-240	2.720E-09

Methodology and Assumptions

The first attempt to develop a radiological profile for the Paths to Closure SRS LLW Sludge (2nd waste from AI) waste stream was based on a composite of the four "othersolid" LLW/MLLW streams identified for SRS in the 1997 Core database. However, the result produced a profile containing levels of I-129 too high to be accepted at the SRS Slit Trench disposal facility. The second attempt to develop a radiological profile for this waste stream is based on two SRS EAV/CIF LLW Characterization Forms for the two Waste Streams that make up the Paths to Closure stream LLW Sludge (2nd waste from AI). The two SRS streams are sludges from the F Area and H Area groundwater treatment facilities, identified as FAGW-0001-LLW and HAGW-0001-LLW. The H Area stream contains higher levels of I-129 than the F Area stream. For this analysis, it was assumed that each SRS stream corresponded to one-half of the volume of the Paths to Closure stream. The radiological profile for the stream with higher levels of I-129 is based on the SRS EAV/CIF LLW Characterization Form for HAGW-0001-LLW. To convert the source data to the final profile, it was also assumed that the density of this waste stream is 1.6 metric tons/cubic meter.

Table SR-5: Raw Data Used to Develop Radiological Profile (Based on data from SRS EAV/CIF LLW Characterization Form for Waste Stream HAGW-0001-LLW)

Nuclide	pCi/g
Sr-90	452
Y-90	452
H-3	77.3
Co-60	23.7
C-14	4.06
Np-237	2.52
U-238	1.86
U-234	1.565
U-233	0.255
Tc-99	0.226
Cs-137	0.0227

Savannah River Site

Waste Stream ID/Map ID: 02202 / BF (high I-129) Stream Name: LLW Sludge (2nd waste from AI)

Life-Cycle Volume: 1,838.25

Nuclide	pCi/g
Ba-137m	0.0215
I-129	0.00824
Pu-239	0.00726
Pu-240	0.0017

**Table SR-6: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
Ac-228	2.329E-09
Am-241	3.786E-09
C-14	5.341E-10
Ce-144	1.284E-08
Cs-137	2.032E-04
Co-57	1.149E-08
Co-60	1.176E-10
Cm-243	2.772E-08
Cm-244	2.772E-08
Eu-152	3.177E-08
Eu-154	2.231E-08
Eu-155	2.362E-10
H-3	4.688E-08
Pb-212	8.503E-10
Ni-63	5.679E-08
Pu-238	2.434E-07
Pu-239	8.123E-09
Pu-240	8.112E-09
K-40	6.046E-10
Ra-226	3.823E-08
Sr-90	2.861E-04
Sr-89	2.512E-04
Tc-99	3.861E-08
Th-228	8.503E-10
Th-232	8.503E-10
U-233	5.371E-09
U-234	5.870E-09
U-235	4.724E-11
U-238	4.174E-09

Methodology and Assumptions

In the 1997 Core database, there are 13 solid LLW/MLLW streams at SRS with ex-situ responses and characterization data. These streams include five OtherSolid streams (four LLW and one MLLW), seven soil streams (six LLW and one MLLW), and one LLW paper/cloth stream. The radiological profile for the SRS LLW stream, LLW Soil, Rubble, Debris (Dispose) was initially based on a composite of the six LLW soil streams and the LLW paper/cloth stream. These seven streams were selected because they were LLW (not MLLW) and because their media types as identified in the Core database were closest to that indicated for the two streams in the Paths to Closure data (i.e., soil/sediment and rubble/debris). However, the resulting profile included I-129 at levels potentially exceeding what could be accepted at the Slit Trench. Subsequent discussions with SRS personnel determined that there was no detectable I-129 in the actual waste to be included in this waste stream. As a result, I-129 was removed from the radiological profile.

To use the characterization data for these waste streams, the following simplifying assumptions were made:

- 1) Maximum nuclide concentrations were used where there were no average concentrations in the Core database.
- 2) The density of all waste was assumed to be 1.6 metric tons/cubic meter.
- 3) Concentrations of gross alpha and beta were assumed to represent other nuclides appearing elsewhere in the radionuclide concentration data (e.g., uranium and technetium).
- 4) Cesium was assumed to be Cs-137.

Savannah River Site

Waste Stream ID/Map ID: 02184 / AA

Stream Name: LLW Soil, Rubble Debris (Dispose)

Life-Cycle Volume: 41,791.04

Table SR-7: Raw Data Used to Develop Radiological Profile (from 1997 Core Database)

Core Reporting Level	WS ID	Response	Waste Type	Volume (m3)	Nuclide	Average Concentration	Maximum Concentration	Units
R-REACTOR SEEPAGE BASIN	Soil-02	CT1	LLW	185.00	CESIUM-137		8000000	pCi/L
R-REACTOR SEEPAGE BASIN	Soil-02	CT1	LLW	185.00	STRONTIUM-89		16270	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-02	CT1	LLW	185.00	STRONTIUM- 90		16270	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-02	CT1	LLW	185.00	ALPHA		84	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-02	CT1	LLW	185.00	BETA		17000	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-03	3T1	LLW	20.00	STRONTIUM		16270	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-03	3T1	LLW	20.00	CESIUM		32000	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-03	3T1	LLW	20.00	ALPHA		84	pCi/g
R-REACTOR SEEPAGE BASIN	Soil-03	3T1	LLW	20.00	BETA		17000	pCi/L
K-REACTOR SEEPAGE BASIN	Paper/Cloth-01	3T1	LLW	6.00	STRONTIUM- 90		16270	pCi/g
K-REACTOR SEEPAGE BASIN	Paper/Cloth-01	3T1	LLW	6.00	CESIUM-137		8000000	pCi/g
K-REACTOR SEEPAGE BASIN	Soil-01	CT1	LLW	1,800.00	STRONTIUM- 90		16270	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	COBALT-57		17	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	COBALT-60		0.1739	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	CERIUM-144		19	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	AMERICIUM-241		5.6	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	CESIUM-137		33000	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	CURIUM-243		41	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	CURIUM-244		41	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	EUROPIUM-152		47	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	IODINE-129		180	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	ALPHA-(gross)		60	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	PLUTONIUM-239		12	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	ACTINIUM-228		2.6	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	URANIUM-238		3.1	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	HYDROGEN-3		12	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	EUROPIUM-154		33	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	BETA		12000	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	URANIUM-233		4.8	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	CARBON-14		0.79	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	RADIUM		56	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	TECHNETIUM-99		56	pCi/g

Savannah River Site

Waste Stream ID/Map ID: 02184 / AA

Stream Name: LLW Soil, Rubble Debris (Dispose)

Life-Cycle Volume: 41,791.04

Core Reporting Level	WS ID	Response	Waste Type	Volume (m3)	Nuclide	Average Concentration	Maximum Concentration	Units
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	STRONTIUM- 90		7700	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	PLUTONIUM-240		12	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	PLUTONIUM-238		360	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	URANIUM-234		4.8	pCi/g
F&H RETENTION BASINS	Soil-01	CT1	LLW	8,100.00	NICKEL-63		84	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	THORIUM-232		1.8	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	THORIUM-230		0.7	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	URANIUM-238		4.4	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	POTASSIUM-40	1.28	2.4	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	PLUTONIUM-239	0.0233	1.81	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	BETA		570	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	ALPHA-(gross)		18	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	CESIUM-137	0.0956	10.1	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	EUROPIUM-155		0.5	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	STRONTIUM- 90		170	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	TECHNETIUM-99		1.6	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	URANIUM-234		4.5	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	URANIUM-233		4.5	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	LEAD-212		1.8	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	ACTINIUM-228	1.21	1.57	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	THORIUM-228		1.8	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	HYDROGEN-3		22	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	URANIUM-235		0.1	pCi/g
F&H RETENTION BASINS	Soil-02	CT2	LLW	5,660.00	RADIUM-226	0.793	1.21	pCi/g
OLD F-AREA SEEPAGE BASIN	Soil-01	CT1	LLW	3,400.00	URANIUM-234		1.76	pCi/g
OLD F-AREA SEEPAGE BASIN	Soil-01	CT1	LLW	3,400.00	THORIUM-230		0.93	pCi/g
OLD F-AREA SEEPAGE BASIN	Soil-01	CT1	LLW	3,400.00	BETA		120	pCi/g
OLD F-AREA SEEPAGE BASIN	Soil-01	CT1	LLW	3,400.00	ALPHA-(gross)		60	pCi/g
OLD F-AREA SEEPAGE BASIN	Soil-01	CT1	LLW	3,400.00	HYDROGEN-3		100	pCi/L
OLD F-AREA SEEPAGE BASIN	Soil-01	CT1	LLW	3,400.00	BETA-(gross)		120	pCi/g

**Table SR-8: Radiological Profile for
Paths to Closure Waste Streams**

Nuclide	Ci/m ³
H-3	8.453E-06
C-14	2.182E-07
Ni-59	2.114E-07
Co-60	9.889E-08
Sr-90	9.435E-06
Ru-106	1.057E-07
I-129	3.410E-09
Cs-137	1.551E-05
Ce-144	6.479E-08

Methodology and Assumptions

The first attempt to develop a radiological profile for the Paths to Closure SRS LLW Vegetation waste stream was based on a composite of six soil and one paper/cloth solid LLW/MLLW streams identified for SRS in the 1997 Core database. However, the result produced a profile containing levels of I-129 too high to be accepted at the SRS Slit Trench disposal facility. The second attempt to develop a radiological profile for this waste stream is based on an SRS EAV/CIF LLW Characterization Form for stream RSBV0001, which corresponds directly to the LLW Vegetation stream.

Table SR-9: Raw Data Used to Develop Radiological Profile (Based on data from SRS EAV/CIF LLW Characterization Form for Waste Stream RSBV0001)

Curies	ft ³	Nuclide	% of Total
3.38E-02	35,000	H-3	24.79
		C-14	0.84
		Ni-59	0.62
		Co-60	0.29
		Sr-90	27.67
		Ru-106	0.31
		I-129	0.01
		Cs-137	45.48
		Ce-144	0.19

Appendix E. Definitions and References

E.1 Definitions

The following definitions and terms are used in this Report:

Access/Institutional Control and In-situ Treatment and Containment: The Environmental Restoration program plans to manage a significant portion of its contaminated media without physically removing or excavating them, thus generating no LLW or MLLW for disposal. If the degree of contamination is relatively low and the volumes relatively large, an appropriate response may be access/institutional control. Public access to the area of contamination is restricted either through land deeds or a barrier such as a fence and posted warnings. The type and degree of contamination may also warrant an in-situ response. These remediation strategies will allow the Environmental Restoration program to address these elements in place and thus minimize or eliminate the generation of LLW and MLLW.

Combustion: This technique transforms the waste to a less reactive form and reduces its volume. Incineration is used for combustible dry active waste and LLW containing certain organic liquids and waste oil. Incineration can achieve high-volume reduction factors.

Compaction: This technique reduces the physical volume of the waste by mechanical compression.

Contaminated Media: The Environmental Restoration program will address millions of cubic meters of soils, sediments, sludges, debris, and water potentially contaminated with radionuclides and hazardous constituents. This Report does not consider contaminated media as LLW or MLLW when the media are addressed through in-situ containment or treatment remediation strategies. LLW or MLLW are generated when remediation strategies generate excavated or removed materials that require disposal in specially engineered disposal facilities.

Deactivation: The deactivation process places a facility in a safe and stable condition that minimizes the long-term cost of a surveillance and maintenance program and is protective of workers, the public, and the environment until decommissioning is complete. Actions include the removal of fuel, draining and/or de-energizing of nonessential systems, removal of stored radioactive and hazardous materials, and related actions. Source: "DOE D&D Resource Manual" (DOE/EM-0246)

Decommissioning: Decommissioning takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken at the end of the life of a facility to retire it from service with adequate regard for the health and safety of workers and the public and protection of the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site. Source: "DOE D&D Resource Manual" (DOE/EM-0246)

Dewatering: This is a process usually used as a liquid removal technique to treat wet solids. Pumping and gravitational drainage can be used to remove the water from semi-solid LLW. Ion-exchange resins are commonly treated using “in-container dewatering.”

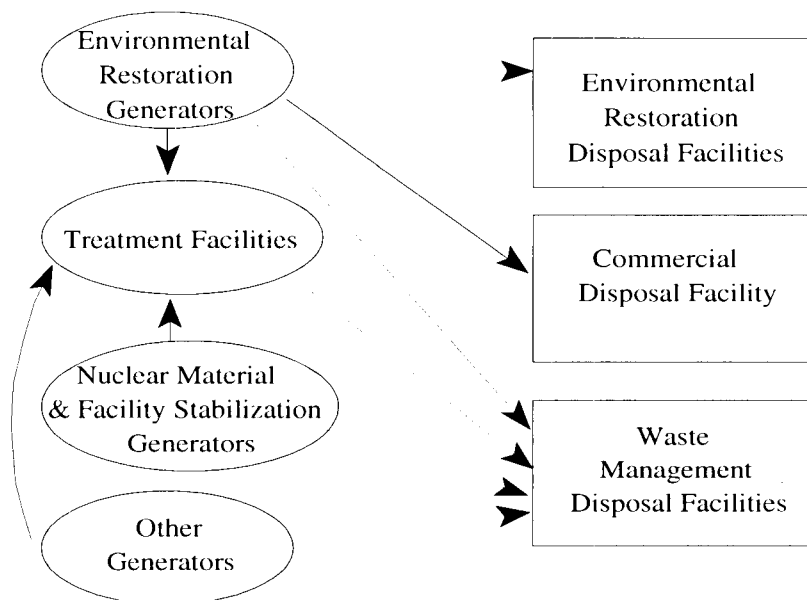
Disposal Facilities: DOE Order 5820.2A defines a disposal facility as the land, structures, and equipment used for disposal of waste. A disposal site is the portion of a disposal facility that is used to dispose of waste. For LLW, it consists of a disposal unit and a buffer zone. A disposal unit is the discrete portion (e.g., a pit, trench, tumulus, vault, or bunker) of the disposal site into which waste is placed for disposal (Source: DOE Order 5820.2A). The Department has stipulated that waste management disposal facilities at only three sites (Hanford Site, Savannah River Site, and Nevada Test Site) accept waste from offsite generators. Environmental Restoration-operated disposal facilities are designed and constructed to manage LLW/MLLW generated by onsite remediation activities only.

Disposal Ready Volume Projections: LLW and MLLW are generated by a number of Department of Energy programs and disposed by Environmental Restoration-operated and Waste Management-operated facilities, as well as commercial facilities. LLW and MLLW volume projections vary depending on the point in time at which they were reported. Figure E.1 provides a conceptual outline of the flow of LLW and MLLW between the various Department of Energy programs. Projection data are available for a number of different volumes, from initial LLW generated from a remediation response to contaminated media to volumes transferred for treatment to volumes transferred for disposal. In general, data on treatment were not available. The projections reported in this Report represent the waste volumes requiring disposal in engineered facilities. Volume projections transferred by any generator to the Waste Management program for treatment and/or disposal represent the volumes at the time of transfer to the Waste Management program. As certain types of treatment, such as compaction or incineration, may significantly reduce volumes for final disposal, these volumetric projections may overstate required disposal capacities. Moreover, employing aggressive waste minimization techniques may further reduce the volume projections.

Disposal in Environmental Restoration Facilities: This disposition category consists primarily of disposal in the planned Environmental Restoration program-operated disposal facilities. Appendix A contains a detailed discussion of the Environmental Restoration program’s current and planned disposal facilities. Note that these disposal facilities will accept only onsite remediation LLW or MLLW.

Disposition to be Determined: Some sites did not report a final disposition remediation strategy for specific elements. Examples include collection and treatment or collection and storage (the Report did not consider these remediation strategies as final disposition types) where no additional responses were provided by the sites. Other sites did not have sufficient data to provide an initial volume of contaminated media. Finally, some sites dispositioned only fractions of certain elements. In all these instances, the Report segregated these elements into the “disposition to be determined” category.

Figure E-1. Department of Energy Waste Flows



Evaporation: This is a concentration method that can be used on many different liquid wastes and slurries.

Low-Level Waste: DOE Order 5820.2A defines low-level waste as waste that contains radioactivity and is not classified as high-level waste, transuranic waste, spent nuclear fuel, or 11e(2) byproduct material as defined by [DOE Order 5820.2A]. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic is less than 100 nanocuries per gram.

Mixed Low-Level Waste: DOE Order 5820.2A defines mixed low-level waste as waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act, respectively.

No Further Action: After consulting with stakeholders and regulatory agencies (whether the Environmental Protection Agency, other Federal agencies, or State and local agencies), the Environmental Restoration program may determine that no further action is appropriate. Sites reported a number of elements that have been determined as or are forecasted to require no further action.

Sedimentation and Precipitation: These processes are used to concentrate the radioactivity of liquid LLW into a small volume of wet solids.

Solidification and Stabilization: These processes are used to convert LLW to a stabilized form to

prevent degradation and release of radionuclides.

Transfer to Commercial Facility for Disposal: The Environmental Restoration program plans to transfer some of its LLW and MLLW to commercial facilities for disposal (the Department currently transfers waste to the Envirocare facility in Utah; other commercial disposal facilities will be considered as they become available).

Transfer to Waste Management for Treatment & Disposal: In this Report, the transfer of any LLW or MLLW to the Waste Management program for treatment, storage, or disposal is considered a final disposition. At specific sites, the Waste Management program plays a central role in the management of LLW and MLLW remediation either onsite or offsite.

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Appendix F. Errata for Capacity Report Revision 0

Changes for the Low Level Waste Disposal Capacity Report, July 30, 1996

Page ii, Line 12

Correction: 13 million should be changed to 12 million.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page ii, Line 20

Correction: 2.0 million should be changed to 2.8 million.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page iii, Line 12

Correction: 5.0 million should be change to 4.0 million.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page iv, Line 4

Correction: volumetric should be added between the words adequate and disposal

Reason: This clarifies in the executive summary that the report only looks at volumetric capacity not radiological capacity. It also keeps this section consistent other sections of the document.

Page 5 to Table 1.2 Historical LLW Disposal Volumes:

Corrections:

Hanford 1987: 202.2 should change to 20.3

Hanford Total: 811.3 should change to 629.2

LANL 1986: 4.5 should change to 3.4

ORR Total: 361.6 should change to 361.4

Reason: The errors in table 1.2 are typographical errors.

Page 28, Line 17

Correction: 3.0 million should change to 2 million

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 28, Line 20 and 21

Correction: The sentence that starts with The majority of the solid waste..... should be replaced with the two following sentences:

The majority of the solid waste for the current inventory is made up of debris waste (36,000 m³). The majority of the solid waste for the life cycle is made up of soil/gravel (836,000 m³).

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 29 to Table 2.9 Waste Management LLW Volumes:

Correction:

Site	Total Volume (1996-00)	Total Volume (2001-30)	Total Volume (2031-75)	Total Life Cycle
NTS	22000	85000	110000	217000
Total	105000	1300000	390000	2000000

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 30 to Figure 2.8:

Correction: The volume information for the NTS in the graphic should be 217,300, this will reduce the size of the section of the graph for NTS. Also the Total will now equal 2,000,000 instead of 3,000,000.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 30 to Table 2.10 LLW Volumes by Physical Form Description:

Correction			
Physical Forms	Total Volume (1996-00)	Total Volume (2001-30)	Total Life Cycle
Debris Waste		300,000	360,000
Soil/Gravel	15,000	800,000	836,000
Other/Unknown	18,000	160,000	460,000
Total	105,000	1,300,000	2,000,000

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 31 to Figure 2.9:

Correction: The values list in the graph for Soil/Gravel should change to read 836,00, the values for Debris Waste should change to read 360,000 and the value for Unknown/Other should change to read 460,000. These three change will effect the size of the graphic.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 38 to Table 2.13: Total Life Cycle Volume for Waste Management Disposition of LLW:

Correction: The value for NTS under the Waste Management column should be changed from 1,300,000 to 217,3000, the value for NTS under the Total column should be changed from 2,500,000 to 1,400,000. The value for total under the Waste Management column should change from 3.000,000 to 2,000,000 and the value for Total under the total column should change rom 5,000,000 to 4,000,000.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 41, Line 9

Correction: 13 million should change to 12 million

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 41, Line 22

Correction: 5.0 million should change to 4.0 million.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 42 to Figure 3.1:

Correction: The value for WM Facilities should change from 5,000,000 to 4,000,000 and the total should change from 13,000,000 to 12,000,000.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 48 to Figure 3.7:

Correction

The following values should be used for the Waste Management portion of the graph:

1996	9341.5
1997	15693.7
1998	16331.2
1999	19159.9
2000	21988.6
2001	24817.3
2002	27646
2003	30474.7
2004	33303.4
2005	36132.1
2006	38960.8
2007	41789.5
2008	44618.2
2009	47446.9
2010	50275.6
2011	53104.3
2012	55933
2013	58761.7
2014	61590.4
2015	64419.1
2016	67247.8
2017	70076.5
2018	72905.2
2019	75733.9
2020	78562.6

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 51, Line 13

Correction: 13 million should change to 12 million.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.

Page 52, Line 3

Correction: 5.0 million should change to 4.0 million.

Reason: An incorrect data source was used for NTS that contained EM-40 and EM-60 LLW. The changes are necessary to reflect the correct waste volumes at NTS.